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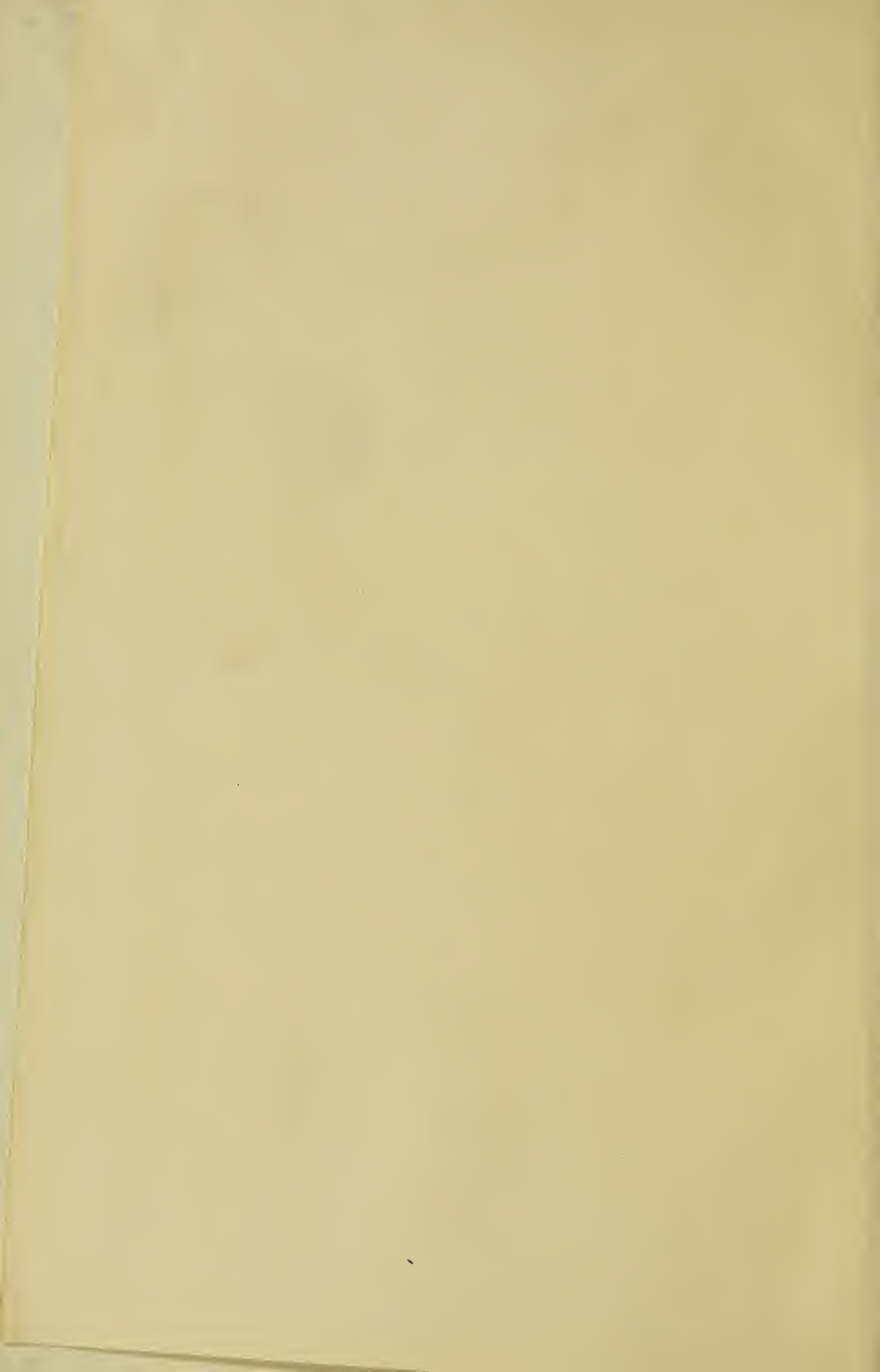
MARBLE DECORATION

GEORGE H. BLAGROVE





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MARBLE DECORATION

AND

THE TERMINOLOGY OF BRITISH AND
FOREIGN MARBLES

A Handbook for Students

BY

GEORGE H. BLAGROVE,

AUTHOR OF "SHORING AND ITS APPLICATION," ETC.

With Twenty-eight Illustrations



LONDON

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PREFACE.

THE present work is the outcome of some practical experience in the architectural uses of marble, supplemented by researches undertaken with the express object of embodying in a compact form information likely to be of service to students and workmen.

In introducing it to the notice of the reader, I take the opportunity of acknowledging some of the principal sources of information upon which I have relied in its compilation.

In my observations upon the nature and properties of marble and other practical matters, as well as in drawing up the terminology which forms the Appendix to the work, I have been greatly assisted by several useful hints kindly given by such well-known firms as Messrs. Farmer and Brindley, of Westminster Bridge Road; Messrs. W. H. Burke and Co., of Newman Street; and Mr. J. Houghton, of Great Portland Street; who have allowed me to examine their collections of marbles. I am also indebted for valuable information to M. Théodore Géruzet, of the Société Anonyme, Grande Marbrerie de Bagnères de Bigorre, Hautes Pyrénées, France. In addition, I have availed myself of the collection at the Museum of Practical Geology, and have consulted works by such eminent authorities as C. P. Brard, T. Chateau, and Sir E. Hull, as well as the articles by Mr. Arthur Lee, which have appeared in the *Building News*; and articles in several English and foreign encyclopædias.

For information on the subject of marble mosaic, I am indebted to Dr. Salviati and Co., of Regent Street, and

to Mr. J. Ebner, of Clerkenwell Road, as well as to the firms previously mentioned. I have also consulted works by Sir M. D. Wyatt, Mr. J. B. Waring, and others, of which I have made use in preparing several of the illustrations.

In endeavouring to convey some idea of the principles which appear to have guided architects in their application of marble to the choicest works of the past, I have almost necessarily followed what has been previously written by those who have treated of architecture upon historical and critical methods. The writings of Fergusson, Owen Jones, Ruskin, and Street, have been consulted for this purpose; and illustrations have been reproduced, in some instances, from their pages. Some reference has been made to Hindoo works in marble; and here the photographs and descriptions published by T. C. Hope and Meadows Taylor have, in addition to the writings of Fergusson, been of assistance. Lectures delivered on various occasions by Messrs. T. Graham Jackson, G. Aitchison, W. Brindley, and others, have supplied *pabulum* for some of my own observations. In so far as my own opinions have found expression in the following pages, it will, I trust, be understood that they are offered in no dictatorial spirit.

G. H. B.

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MARBLE DECORATION.

CHAPTER I.

THE NATURE AND PROPERTIES OF MARBLE.

(1.) THE art of marble decoration consists in applying real marble to purposes partly constructive, but chiefly decorative. In doing this we avail ourselves of the natural colours and patterns of the materials at our disposal, which are sometimes used in solid masses and sometimes in a system of veneering with thin slabs. Before proceeding to describe the methods of design and construction which have been practised with satisfactory results, it will be convenient to give some explanation of the nature and properties of marble.

(2.) Marble is, correctly speaking, a combination consisting chiefly of carbonate of lime, carbonic acid, and water. It burns into quicklime, and is for the most part soluble in acids with effervescence. In the language of the architect and marble mason, however, all stones are called marble which are harder than alabaster or gypsum, and which are capable of receiving a good polish. The materials available in marble decoration include, besides various kinds of marble, granite, porphyry, serpentine, several varieties of spar, and alabaster. For descriptions of these materials, and the names of the localities from whence they are obtained, the reader is referred to the terminology of British and foreign marbles given in the Appendix. It must be understood, however, with reference to these descriptions, that specimens of any marble will

often differ widely in appearance, both as regards colour and pattern, according to the particular part of the quarry from whence they are obtained.

(3.) For purposes of commerce, marbles are divided into two classes, the antique and the modern. Antique marbles are those which were employed by the ancients, but of which the quarries have either been exhausted or their situations become unknown. Some of the ancient quarries have from time to time been rediscovered and worked; but in the majority of cases, the antique marbles are only obtainable in fragments taken from the ruins of ancient edifices. Modern marbles are those which are quarried now, and it often happens that some of them bear such close resemblances to antique specimens that they are sold under the same names.

(4.) Marbles have been classified under eight groups, viz.: the uni-coloured, which includes only black and white; the variegated, having irregular spots and veins; the madreporic, which contain fossil remains of madrepores or similar organisms, generally apparent as white or grey spots, with regularly disposed stars and dots in the centre; the shell marbles, containing only a few shells; the lumachella, consisting of shells closely united by means of a paste; the cipollino, having veins of green talc; the breccia, containing angular fragments united by a paste; and the puddingstone, containing rounded fragments similarly united. Most of these terms are explained, with reference to the particular marbles to which they are applied, in the terminology already mentioned.

(5.) Most marbles are delivered from the quarries in a rough condition, and rarely sawn into blocks. Sicilian or Ravaccione is in scappled blocks. The veined and dove marbles of Italy are sawn into scantlings varying between one and two feet in thickness. The selection of blocks at the quarry requires some judgment and experience. The following practical hints by Mr. Arthur Lee, which appeared in the *Building News* for July 8, 1887, are commended to the attention of the reader: "Never select blocks in bright sunshine. The best time is on a cloudy day after a shower of rain, and early in the morning. If

a block can be 'looked into' at all it will be then. In selecting blocks of statuary a sharp look-out should be kept for yellow spots or veins; they are less likely to be noticed than black ones, which are more easily discovered. Much of the statuary imported from Italy is unfit for sculpture at all. It is very white, with a bright sparkling crystal and a taking appearance; but it crumbles under the chisel, is of a soft, sugary substance, and very quickly decays. The best blocks are hard and close-grained, and if of uniform tint, are none the worse for a slightly yellowish cast; they work evenly under the chisel, and are not too transparent."

(6.) When marble has been sawn or shaped as required for fixing, it is rubbed with sand of varying degrees of fineness, with grit-stone, and with several kinds of hone slates, amongst which "snake" is much in favour. After this it is finished with glass-paper, or subjected to certain processes of polishing, by hand or by machinery, in which pumice and fine emery powders are used; then tripoli, which is an earthy mineral powder; and the final polish is given with tin-putty or putty-powder, which is an oxide of tin. Some of these powders are rubbed in by means of a plate of iron, and in Italy lead is used for this purpose. In all these successive operations a constant supply of trickling water is necessitated.

(7.) It would be foreign to the present purpose to describe more fully the various processes of polishing marble. The most durable finish is obtained by means of tin-putty. Alum has been occasionally employed for rapid polishing, but the surface produced by it is only of a factitious character, and easily impaired. Théodore Chateau* mentions a test by which the use of alum can be detected. Water is applied to the surface of the marble, when, if alum be present in any considerable quantity, the water will be absorbed, leaving a dull white stain. With regard to this test, it is to be observed that a high polish, even if legitimately obtained, is always more or less impaired by the application of water. The test should therefore be applied only near the edges of

*"Technologie du Bâtiment." Paris, 1863-69.

polished slabs, or to such portions as are not intended to be seen. It is scarcely necessary to point out that the effect of the colours subsisting in marble is greatly enhanced by the aid of polish, and that the colours of unpolished specimens may be better appreciated when their surfaces are moistened with water.

(8.) The liability of marble to decay is a matter for important consideration, as it cannot be doubted that this has largely tended to discourage its use in this climate. The coloured materials capable of receiving a high polish, which are best adapted for external use are the granites and porphyries. Most of the marbles do not preserve their colour and texture at all well when exposed to the action of the weather, and the serpentines are particularly susceptible in this respect. It has been observed that when marble has been exposed to the weather for thirty or forty years the crystals no longer adhere firmly together. Under favourable conditions, in the absence of a smoky atmosphere like that of London, the external appearance of marble may remain unaltered; but the influence of the weather continues to penetrate into the mass, and after the lapse of about a century it falls into a kind of sparkling sand. It must be generally understood, therefore, that the art of marble decoration is intended to be applied to the interiors of buildings, where it probably affords the most durable means of producing polychromatic effects, with the exception of faience, to which it is certainly superior as regards precision of outline. Even in interiors, however, marble is liable to a gradual process of disintegration, induced by changes of temperature, which cause its crystals to expand and contract until it has lost its homogeneity. It has been observed that those variegated marbles in which the boundaries of colour are sharply defined are more liable to a separation of parts than those in which the colours blend and intermingle; and in all situations where marble is exposed to extremes of heat, as in the jambs and mantels of chimney-pieces, and in the boxed enclosures to hot-water pipes, it is important to remember these considerations. Vibratory shocks will also contribute to the disintegration of marble; and pudding-

stones, conglomerates, and brecciated varieties, supposed to have been formed in remote periods from small fragments of older rocks united by a natural cement, have been sometimes shaken to pieces in the process of working.

(9.) Pure white statuary marble, and the ordinary so-called Sicilian or Ravaccione, may be regarded as practically homogeneous, especially when the veins are of a cloudy and ill-defined character. Marbles of this kind, when used for columns, or in other situations where great resistance to compression is desired, is generally understood to possess an ultimate strength of 6,000 lbs. per square inch of sectional area, or let us say that it will take a safe load of 36 tons per superficial foot. The average weight of marble being 170 lbs. per cubic foot, it becomes easy to calculate the bearing capabilities of any piece of solid work. But when we are dealing with marbles in which the streaks or markings are of a clearly defined character, we must not rely upon any such margin of strength. In marbles like Grand Antique, for example, where we have jagged streaks of white and pale grey running in almost parallel directions upon a ground of dark grey and black, there is a danger of fissures occurring in the direction of the streaks; and it would be an act of imprudence to work such a marble into columns with the streaks running in vertical directions, although this arrangement would have a satisfactory decorative appearance. Marbles of this character should be subjected to pressure only in directions at right angles to their cleavage.

(10.) Various preparations are used by marble masons for filling up small interstices which occasionally appear in marble, so as to give it a perfectly even appearance. Gum shellac is the principal ingredient used for this purpose, and sometimes colouring matters are combined with it, in order to make it agree in appearance with the marble to which it is applied. Chateau gives a recipe for a lute or stopping for filling up the interstices of marble. It consists of yellow wax, resin, and Burgundy pitch, made into a thick paste with a little sulphur and finely-sifted plaster. A kind of red putty (*potée rouge*) is made with six parts of sulphate of iron to one of rough saltpetre.

This mixture is exposed for twenty-four hours, then reduced to a powder, washed several times, and rolled into sticks for use. A little of this and some lampblack are combined with colouring matter and mixed with the stopping. For green or yellow marbles Chateau recommends a stopping made with gum shellac and sealing-wax of the colour required. This is spread over the marble, and takes a good polish. Sometimes small fragments of marble are combined with a stopping, but this is only in dealing with the coarser kinds of marble. When any such preparations as these have been employed, it will be understood how undesirable it is to expose the marble to the influence of heat, which may disfigure it by melting the stopping.

(11.) Several processes are recommended for cleaning marble and removing stains from it. For ordinary washing, soap and water with the addition of a little soda will suffice. A popular recipe consists of two parts of common soda, one of powdered pumice-stone, and one of powdered chalk. These ingredients are passed through a fine sieve, and then made into a thin paste with water. The marble is well rubbed over with this preparation, which is then washed off with soap and water. A somewhat better preparation, because less likely to disturb the polish, is made with finely powdered pipeclay, mixed with one quarter of a pint of ox gall, one quarter of a pint of strong soap-suds, and half a gill of turpentine, all made into a smooth paste. This is laid over the surface of the marble with a brush, and then left for two days, after which it is washed off.

(12.) For removing stains caused by the rust of iron or by the juices of fruit, some strong acids are used. Equal parts of lemon juice and spirits of vitriol form an application with which the stained portions may be just wetted and left for a few minutes, after which the acid is washed away. A case came under my own knowledge, in which some white marble mantelpieces had been stained during transport on board ship, it was supposed by some acid. A weak solution of sulphuric acid and water was used. The operator had two vessels, one filled with the solution, and

the other with pure water. He applied a little of the solution to the stained portions with a sponge, immediately washing it away with water. In this way the stains were all removed.

(13.) We cannot hope to employ such remedies as these without impairing the surface of the marble; and in most cases where stains have been removed, the process of repolishing has been necessitated. Polish affords a certain amount of protection against grease stains, or gradual discolouration by contact with a smoky atmosphere. The latter takes place with comparative rapidity in the case of unpolished statuary marble, and there is no doubt that the impurities retained by the material are absorbed to some depth below the surface. For effectually cleaning marble which has arrived at this condition, as well as for removing stains from it, the following process has been adopted by marble masons:—

The marble is laid, exposed to the atmosphere, in a bed of clean wet sand, the sand being so arranged as to surround the marble up to its thickness, so as to be level with the upper surface. The marble is sluiced with water two or three times a day, until it has become perfectly clean. New stone slabs or new deal boards are used underneath and around the sand, to prevent the possibility of its imparting any stain to the marble. This process of cleaning will generally occupy from ten to fifteen days. In the case of polished marble, the polish must first be removed by rubbing with sand.

(14.) The surface of marble has been protected at times against the destructive influence of the atmosphere by means of special preparations. A preservative solution manufactured by the Indestructible Paint Company has been applied to this purpose with success. Methods of producing such preparations are kept secret, but the following recipe for a "wax varnish" for protecting the surfaces of statues and ornaments exposed to the air, is recommended by some authorities: One part of wax is melted and mixed with four parts of pure essence of turpentine. The mixture is used hot, being spread thinly over the surface of the marble.

(15.) Marble possesses a certain degree of flexibility, and thin slabs have been known to bend with their own weight. Sometimes a slab forming the soffit of a mantel will sag down in the form of a bow, its deformation being doubtless assisted by the heat of the fire. Sometimes such a slab has been restored to its normal straightness merely by being supported for some time in a reversed position, having a weight suspended from it in the middle. Sometimes it has been straightened by being placed under water and weighted. A slab that has become bent ought not to be allowed to remain *in situ*, for there is no knowing how soon or how suddenly its fracture may occur. Bent slabs cannot therefore be used in decoration for the soffits of arches, or in other situations where circular work is required, but the material must be shaped to the requisite forms.

CHAPTER II.

CEMENTS AND MASTICS.

(16.) HAVING considered the nature and properties of marble, I now propose to describe some of the cements and mastics employed for uniting its blocks, slabs, or tesserae together. Some lutes or stoppings for closing up the fissures of marble have been mentioned in the preceding chapter (§ 10). We are not therefore concerned with these, although many of the mastics used for joining purposes are analogous in their composition.

(17.) Bituminous cements have been employed for jointing floors of marble mosaic. For setting large tesserae, a black earth mixed with boiling pitch has been used. Such preparations are inferior in durability to cements made with lime. For setting smaller tesserae, some authorities recommend oleaginous cements. One of these is made with the calcareous stone of Tivoli, pounded and mixed with oil. Another is made with twenty parts of litharge and one of freshly burnt lime in a dry powder, made into a putty with linseed oil. It sets hard in a few hours. Another, called mason's mastic, consists of pulverised bricks, quicklime and wood ashes, in equal parts, all mixed and diluted with olive oil. This mastic hardens immediately in the air, and does not crack under water. Another cement or mastic to resist the action of water is made with two parts of hydrochlorate of ammonia, one of flour of sulphur, and sixteen of iron filings free from rust. The whole is reduced to a powder, and kept from the access of air. One part of this powder is used with twenty of iron filings, and sufficient water to form a stiff paste. It takes about three weeks to set, when it becomes as hard as iron.

(18.) Several authorities recommend a "mastic of filings," or "fountain-maker's cement," for jointing marble in situations where the clean and delicate appearance of the joints is not a necessity, but where a cement is required that will effectually resist the action of water. This preparation consists of $26\frac{1}{2}$ pounds of iron filings, with which copper filings may be combined, while both must be free from rust, $4\frac{1}{2}$ pounds of salt, and four garlies. These ingredients are soaked for twenty-four hours in $3\frac{1}{2}$ pints of vinegar, with a little urine. The liquid is poured off, and the thick paste remaining is the mastic, which is to be used at once.

(19.) A "mastic de Corbel" is mentioned by Chateau and others, for making the joints of steps and terraces in situations exposed to variations of temperature, but not to damp. It is made with six parts of Burgundy tile, pounded and passed through a fine silken sieve, one of litharge, one of pure white lead, three of linseed oil, and one of lard oil. The whole is well mixed and preserved in cakes for use.

(20.) Portland cement is not generally used for jointing marble, owing to the discolouration liable to be produced by it. In marbles of dark heavy colours, however, this discolouration is not observable, and large blocks are sometimes bedded and jointed with Portland cement. A kind of cement used occasionally for this purpose is made with twelve parts of Portland cement, six of slaked lime, and one of infusorial earth, all made into a thin paste with common salt and water. This cement sets hard in twenty-four hours.

(21.) When a wall is veneered with thin slabs of marble, a backing is required, which is usually about $\frac{3}{4}$ of an inch thick. For the backing, ordinary lime-and-hair plaster is used, combined with one-third part of fine dust, which may be made from pounded tiles, or brick, stone, or marble dust. Plaster alone has a tendency to swell and burst out the marble work.

(22.) The material almost universally employed for jointing internal marble work is plaster of Paris, usually combined with alum, and forming Keene's cement. The

alum retards the process of setting. The most approved method of preparing the plaster is to take moderate-sized lumps of the raw gypsum or alabaster, from which plaster of Paris is made, and to burn them at a temperature just below red heat. A solution is made with one part of alum in ten of water, and in this the lumps of gypsum are immersed while warm for about fifteen minutes, when they become thoroughly saturated. They are then drained dry and burnt to a red heat, and being afterwards powdered, are mixed with water for use. This forms a slow-setting cement of great durability.

(23.) A cement recommended by several authorities is made in the following manner. About one hundred snails are caught, and kept fasting for about six or eight weeks, care being taken to clean them occasionally. They are then sprinkled with a little water to induce them to quit their shells, any excess of water being drained off as soon as the snails come out. A pinch of common salt, a little vinegar, and the juice of four or five lemons are now added, and the whole is well beaten up together. The snails give off their mucus, which is collected and mixed in a mortar with $4\frac{1}{2}$ drachms of gum tragacanth, rather less than half a gill of garlic juice, and about half a pint of alcohol. This cement is to be applied cold, but the joints made with it must afterwards be exposed to the heat of the sun, or a fire. It sets perfectly opaque, and may be coloured to match the marble.

(24.) A more durable cement is said to be made by putting 3 per cent. of borax or sal-ammoniac into a solution of chloride of zinc having a specific gravity of about 1.50. Oxide of zinc, previously subjected to a red heat is added, until the mass attains the desired consistence. It is stated that this cement sets as hard as the marble itself, and may be used for moulded work.

(25.) A cement in use for mending small broken portions of marble is made with eight parts of resin, one of litharge, and four of plaster of Paris. These ingredients are mixed by fusion, and the parts are joined hot. This cement sets rapidly.

(26.) A neatness of appearance in the joints is essen-

tial in internal work placed near the eye. A fat mastic or *mastic gras*, is prescribed by Chateau for application to the outer edges of marble blocks and slabs, so as to make them join with neatness and precision. This mastic is made with two parts of wax, three of Burgundy pitch, and eight of resin, all melted and mixed, and hardened into cakes by immersion in cold water. This mastic is sometimes mixed with finely powdered stoneware fragments, and used for stopping the holes in which cramps are inserted for holding pieces of marble together.

(27.) Marble mosaic work is usually bedded and jointed in ordinary mortar made with lime and sand. Sometimes fine tile dust is substituted for sand, and this gives a general warmth of tone to the jointing, which is very agreeable. Sometimes marble dust is used, and it may be from the same marble as the majority of the tesserae. Sometimes the joints are raked out and pointed with mortar to match the colours of the various tesserae. This is a laborious operation and quite unnecessary for ordinary work. A very clean joint is required in uniting those gold and silver mosaics of which the body consists of glass, and which are used in conjunction with mosaic work in marble. For jointing these a cement is used composed of lime, finely powdered tiles, white of eggs, and gum andragan. The ancients are stated to have used one part of slaked lime and three of pounded marble, made up with water and white of egg. This, however, has been found to harden too rapidly for convenience, and a cement is used compounded of one part of slaked lime and three of finely powdered travertine stone—a whitish concretionary limestone, deposited from the water of a spring holding lime in solution—mixed with linseed oil and stirred every day, the oil being added as it dries. This preparation is ready sooner in warm than in cold weather, occupying between twenty and thirty days in manufacture, after which it resembles a smooth ointment.

CHAPTER III.

THE ARRANGEMENT OF COLOURS.

(28.) It is most essential, in forming designs with variously coloured marbles, to so arrange the materials as to produce agreeable decorative results. There are certain principles of colour-decoration recognised amongst artists who work with paint or distemper, and these principles should as nearly as possible be followed in employing the natural colours of marble. It must be understood that in advocating certain methods of arrangement, I have no wish to dogmatise or to lay down hard and fast rules, but merely to enunciate broad principles for general guidance.

(29.) One of the first rules in decoration is that the lightest colours should be applied to the largest surfaces. The surface of a panel may not exceed the united superficies of its stiles and rails, but it should be lighter, if anything, than these latter, because its surface is seen in one mass.

(30.) No colour in a decorative composition should appear isolated, or strike attention on account of its singularity. To avoid this, and to produce a generally harmonious effect, colours should be repeated. Thus, the general colour of a dado may be repeated, although in smaller sizes, in the frieze; the colours in the skirting should be repeated in the dado-capping, and again in the cornice; and in the case of a marblé ceiling, some of the colours in it should be identical with some of those in the wall-panelling, although the latter may well be darker in its general tone.

(31.) The darker and heavier colours should occupy the

lower part of a composition, and the lighter colours the upper parts. It is desirable to make ceilings appear remote, avoiding in them large masses of heavy or startling colour, which may bring them nearer to the eye in appearance. Heavy colours of no very decided tone may properly prevail in floors, to which they give the appearance of firmness and solidarity, but colours of startling brilliancy will give a floor the appearance of rising.

(32.) The primary colours, red, blue, and yellow, are usually sparingly employed, blended tints being mostly applied to large surfaces. In marble, the pure primary colours are not available in large sizes, as their effect is subdued by means of veins and spots. It is easy, therefore, to avoid glaring effects, the difficulty being, as a rule, to obtain any pure colour at all. Pure blue in any considerable size is never found, all the so-called blue marbles being greyish or slate-coloured. There are certain kinds of spars in which we find brilliant blue, but only in small patches. The general effect of blue in decoration is to give the effect of distance, and therefore of size, to any part of a composition. Hence in ceilings or in similar situations, bluish-grey and bluish-white marbles will best produce the desired effect. With red, yellow, orange, and especially gold, the contrary result is obtained; and these should therefore be applied to parts which we desire to bring into prominence. Striking contrasts of colour should be used with caution upon a large scale, but are most appropriate in small patterns, as in mosaic work, for example.

(33.) Decoration in colour may be arranged according to harmonies of analogy or of contrast, as explained by Chevreul.* This writer recognises six kinds of harmony in colour decoration—three of analogy, and three of contrast. The following brief explanation of his theory will probably be of service.

(34.) Of the harmonies of analogy, the first is harmony of scale. This is produced by the simultaneous view of

* “The Laws of Contrast of Colour, and their Application to the Arts of Painting, Decoration of Buildings, Mosaic Work, etc.” By M. E. Chevreul. Translated by J. Spanton. London, 1857.

different tones of any one colour, no tones which are widely different being placed in proximity. The second, or harmony of hues, is produced by the simultaneous view of different hues, but belonging to neighbouring scales of colour, such as purple, red, and orange, or orange, yellow, and green, all hues being of the same, or nearly the same, depth. The third, or harmony of a dominant coloured light, is produced by the simultaneous view of colours assorted according to the law of contrast, but with one colour predominating, the effect being such as would result from the view of all these colours through a slightly coloured glass.

(35.) Of the harmonies of contrast, we have first the harmony of contrast of scale. This is produced by the simultaneous view of two very different tones of the same colour or scale of tones. Black and white would afford an example of this; so would deep red and pale pink. The second, or harmony of contrast of hues, is produced by the simultaneous view of tones of colour of different depths, belonging to neighbouring scales or groups of tones. Dark purple and pale orange red would afford an example of this. The third, or harmony of contrast of colours, is produced by the simultaneous view of colours belonging to very distant scales, assorted according to the law of contrast. The difference in the depths of adjacent tones may further augment the contrast of colours. Dark red and pale green, or dark violet and pale orange, in close proximity, would afford examples of this.

(36.) This explanation would be incomplete without giving a definition of what is meant by the arrangement of colours according to the law of contrast, although this is tolerably well known. There are, properly speaking, only three colours, red, yellow, and blue, all other hues being combinations or modifications of these. White is only a combination of all the colours, as is proved by the prismatic or rainbow colours into which white light is separable. To produce the effect of the most complete harmony upon the eye, we must therefore employ the three colours, or such combinations or modifications of them in such proportions as would, if the colours were inter-

mingled, produce the effect of white. We find that when we gaze at one pure colour, such as blue, for example, there is a sense of incompleteness, because the eye demands the presence of red and yellow, either separately or combined to form orange. We can, in fact, produce the complementary hue, which will harmonise with any one pure colour by a combination of the remaining two. Thus, green will harmonise with red, orange with blue, and violet with yellow. Coming to hues of a more compound character, we find that yellowish green harmonises with purple, orange-yellow with violet-blue, and greenish-blue with reddish orange. The amount of colour surface may be regulated according to the depth of tone in each case; thus a small surface of deep red will compensate the eye for a large surface of pale green. This exemplifies the principle already stated (§ 29), that the lightest colours should be applied to the largest surfaces.

(37.) It will be understood from the foregoing observations that those species of harmony mentioned by Chevreul in which various tones of one colour only are admitted, cannot produce perfectly satisfactory impressions upon the eye. There will always be a sense of incompleteness connected with them. This, however, is not objectionable in halls or anterooms, or in suites of apartments through which we may wander, the eye being refreshed by the variety in the prevailing tones of each. A sense of coldness is produced by a composition in which blue predominates, while red, yellow, and gold convey the impression of warmth. An ante-chamber panelled with white or pale grey marble, with the dado, cornice, and framing to the panels in dark grey, and with some of the principal mouldings in black, can form an attractive composition in itself, but is especially valuable if its lack of warm colour can be made to heighten, by contrast, the glory of an interior beyond it, richly decorated in varieties of colour. We must not, however, run into the error of employing too many varieties of colour in any one composition. Some of the finest decorative effects have been produced with not more than three varieties of coloured marble; and indeed it is seldom advisable to exceed this number.

(38.) It may not be out of place here to remark that the semi-transparent effect of polished marbles or granites will not combine satisfactorily with ordinary stone or brick. Such combinations have often been made, but have been condemned upon grounds of taste by eminent architectural critics, amongst whom may be mentioned the late Messrs. Burges and E. Barry. In forming colour combinations with marble, great care should be exercised in selecting the actual slabs or blocks to be used; for large masses often differ widely in parts from small specimens. Moreover, it is seldom safe to rely upon the discretion of workmen in the particular arrangement of patterns. Above all, it is necessary to avoid using large, coarse-looking patterns in small sizes.

CHAPTER IV.

MOSAIC MARBLE WORK.

(39.) THE art of mosaic, or more properly musaic, may be defined as a mode of forming patterns or pictures by the inlaying of small pieces of glass, stone, marble, and sometimes of artificial substances. The descriptions of mosaic here will, however, be confined to those classes of work in which marble, or other natural materials which rank with it, can be employed; except in so far as such materials may be used in conjunction with gold or silver enamels, which are held for decorative purposes to be legitimately connected with marble mosaic.

(40.) The Romans, who appear to have borrowed the art from the Greeks, followed two distinct modes of construction. The first is seen in its earliest form in the *Opus Tessellatum*, the second in the *Opus Sectile*. It is to these modes of construction that we owe two distinct methods of design, which can be followed in floor, wall, and ceiling decoration, with coloured marbles.

(41.) The oldest kind of Roman mosaic was the *Opus Tessellatum*, in which small cubes or *tesserae* of marble, of $\frac{3}{4}$ of an inch average thickness and diameter, were so combined as to form geometrical patterns, amongst which the well known Greek fret was of most frequent occurrence. At first, black and white marble were only used, coloured kinds being introduced later. The *Opus Tessellatum* seems to have been chiefly confined to floor decoration, to which it was admirably suited. It had probably been in use about a century, when the *Opus Figlinum* began to be employed, between twenty and thirty years before the Christian era. In this work, the marble *tesserae* were used

in conjunction with cubes of a vitreous composition. Representations of figures, flowers, and fruit, combined with foliated ornamentation, were produced in various colours, but all in a conventional style, and with little attempt at the effect of shade. The Opus Figlinum was used more in mural decoration than for paving. It was revived at the period of the Renaissance in the sixteenth century, under the name of Roman mosaic, by which it is still known. The Opus Vermiculatum may be regarded as a further development of the preceding, though hardly in a direction most applicable to architectural purposes. In it we find life-like imitations of natural objects, the colours and shadows being reproduced with realistic fidelity by means of various-sized pieces of marble, glass, precious stones, and fictile ware, some pieces not measuring more than $\frac{1}{20}$ th of an inch across. In some mosaics of this character, such delicate gradations of shadow and colour have been obtained as to resemble the productions of the painter's art. But it is now generally admitted that such work is out of keeping with the proper treatment of mosaic, besides being unsuitable for decorations of an architectural character. It may be remarked that what happened in the later developments of the art of mosaic is what has too often happened in connection with other arts allied to architecture: fundamental principles of design which first suggested themselves as being characteristic of the material employed, were lost sight of as mechanical methods of execution became elaborated.

(42.) The Opus Sectile of the Romans was applied more generally in pavements than elsewhere. Mosaic work of this kind was formed with thin slabs of differently coloured marbles, called *crusta*, cut into geometrical shapes and arranged in patterns. Its introduction into Rome dates from about a hundred years before the Christian era. The Romans borrowed the art from the Greeks, who had previously derived it perhaps from a Persian source. Fig. 1 shows a specimen

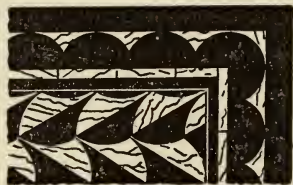


Fig. 1.

of Roman Sectile, in which the pattern betrays a decidedly Oriental origin. Towards the end of the third century, Roman art began to exhibit traces of Oriental influence, resulting from the contact of western civilisation with that of so-called barbaric races. From this time onwards the round-and-square character of the geometrical ornament which Rome had derived from Greece gradually gave place to the angular and interlacing patterns common in Moorish and Arabian designs. Of this kind was the *Opus Grecanicum*, executed with small geometrically shaped pieces of coloured glass, and found in so many of the Romanesque churches of Italy. Long before this period the *Opus Sectile* seems to have fallen completely into disuse, and ancient examples of it are extremely rare.

(43.) At the period of the Renaissance, the *Opus Sectile* was revived in Italy. At Florence was produced what has been regarded as a species of *Opus Sectile*, and commonly known as Florentine mosaic. In this we have thin veneers of coloured marble and more precious minerals laid upon a backing of slate, and so arranged as to produce pictorial representations of natural objects. This class of work is styled by the Italians *Opera di Commesso*.

(44.) A kind of mosaic work called *Opus Alexandrinum* prevailed in Italy for a period of nearly a thousand

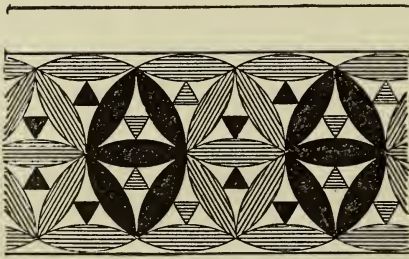


Fig. 2.

years from the commencement of the fourth century, and is supposed to have been introduced into Rome early in the third century. In this work channels were formed in slabs of white or light-coloured marble, and coloured pieces, cut into geometrical shapes, were so inlaid as to form patterns. Dark porphyry and green serpentine were almost exclusively employed for this purpose. *Giallo Antico* is found in some specimens, but is believed to

have been subsequently introduced. In Fig. 2 we have an example of *Opus Alexandrinum* from the border to a pavement in the basilica of Santa Maria Maggiore at Rome, executed in the fourth century. The small triangular pieces of inlay measure not more than a quarter of an inch across.

(45.) Considerable ingenuity was displayed in the production of geometrical patterns in this kind of marble inlay, which long retained its severe purity of character. In the Florentine work we have black and red inlaid upon a ground of white. An example of this is shown in Fig. 3, from a pavement in the Duomo at Florence,

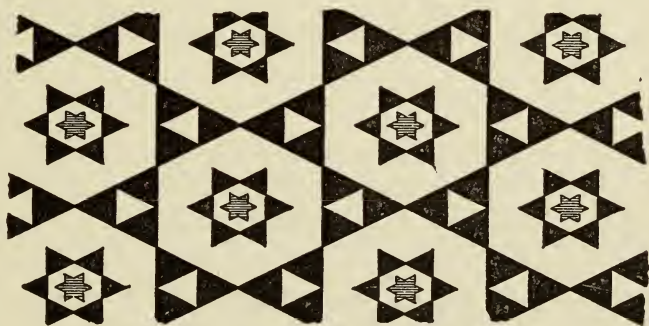


Fig. 3.

executed in the twelfth century. Here the small central stars only are in red. In the form and disposition of this pattern, as in others of the same period, an Oriental influence is traceable. More elaborate and not less pleasing, is the pattern in Fig. 4, which is taken from the Baptistery at Florence, and may be referred to the commencement of the thirteenth century. Later on, conventional imitations of natural forms were gradually introduced, a black mastic being used for inlaying upon white marble. A mastic used for this class of inlaid work at the Cathedral of Siena in 1444, consisted of sixty pounds of pitch, twenty-four of wax, and ten of "bolo"—a kind of black bole or earth. The use of such a material for inlaying resulted in the production of fine lines and naturalistic foliage not consistent with marble mosaic; and

the later specimens of the art show signs of corruption. In Fig. 5 is an example in which some severity of form is still retained. It is taken from the Church of Santa

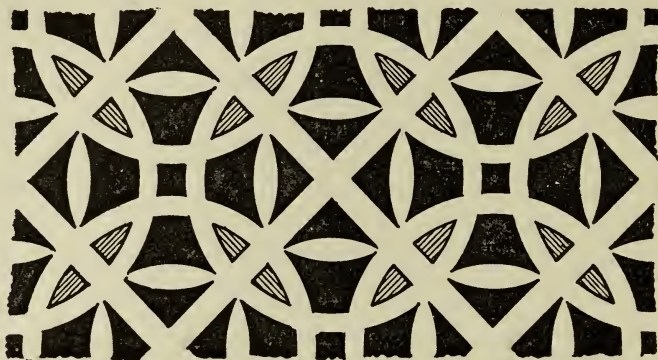


Fig. 4.

Maria Novella, Florence, and belongs to the fifteenth century. In such examples, where we see a more distinctly Gothic character exhibited, broad masses of black

are introduced, which impart a general appearance of heaviness to these designs.

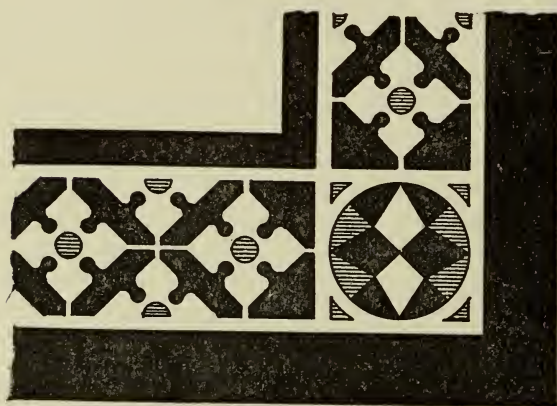


Fig. 5.

(46.) For the decoration of walls and vaults, a kind of inlaid mosaic work was executed in the Roman basilicas between the fifth and fourteenth centuries. In this

kind of work, sacred figure subjects were represented upon a gold ground, with slight indications of shadow; and the style of art was closely allied to that which subsequently found expression in coloured glass. At Florence also figure subjects were executed with marble inlay in pave-

ments, between the end of the thirteenth and commencement of the fourteenth centuries. Grey marble was used for the shadowed portions upon a ground of white, the outlines and hatchings of the figures being filled in with black mastic.

(47.) Examples for our guidance in the application of marble mosaic are sufficiently numerous amongst the works of the past; and our aim should be to select those for study which exhibit the best principles of design in form and colour. Floors, walls, and ceilings are respectively capable of being treated in a distinctive manner, and I now propose to indicate what kind of mosaic is best applicable to each, together with the methods of construction and fixing.

(48.) For floors, we must consider ourselves restricted to the use of granites, porphyries, and coloured marbles, reserving gold and silver enamels for situations not exposed to actual wear. A firm and perfectly level foundation is indispensable. The Roman mode of laying was first to put down a bed of large stones, with very little cement, upon the ground. Over this was spread a mass of concrete, composed with five parts of small stones and two of lime, carefully rammed to a thickness of about nine inches, and to an even surface. This was covered with a layer of a finer species of concrete, composed with three parts of crushed tiles and one of lime, well mixed, spread evenly, and floated to a true face upon which the outlines of the requisite patterns could be scored. The mosaic was then laid, and the whole was well grouted with liquid cement so as to fill all interstices. The surplus cement was afterwards cleaned off, and the surface of the mosaic was polished by rubbing down with marble. In modern work, Portland cement concrete is generally used for the foundation, the mosaic being bedded in mortar made with pounded tiles, as already described (§ 27). The surface is then rolled with granite rollers, which force the tesserae well down into the bed of mortar, which is squeezed upwards into the interstices. Care should be taken to avoid unsettling the tesserae before the mortar is set, and boards are usually laid down over all parts liable to be

traversed by unwary feet. A high degree of polish is not desirable; and most mosaic floors are simply "gritted" or rubbed down with blocks of sandstone to a surface which is sufficiently smooth without being slippery, after which the floor is cleaned by washing.

(49.) The commonest kind of marble mosaic is formed with irregularly-shaped tesserae, broken to an average $\frac{3}{4}$ -inch diameter, and passed through a machine which takes off the sharpest angles. This is the kind of mosaic called *Terazzo* or *T'razzo* by Italian workmen; and the tesserae may be all of one species of marble or of several colours mixed, so as to form a kind of "*Opus Incertum*" in colours. Wooden rakes are sometimes used for spreading the tesserae, so that their colours are evenly distributed throughout, the general effect from a distance being that of a warm grey of moderate depth. For borders and patterns, the tesserae are roughly squared or shaped by hand, as in Roman mosaic. In borders to *T'razzo* mosaic, or any other kind in which there is considerable diversity of colour, it will be found that continuous lines of black are absolutely necessary. A large mass of *T'razzo* paving is agreeably relieved by the introduction of symmetrical patera or other ornaments in black and white, placed at regular intervals. Their diameter is usually greater than the width of the border, and they should be so spaced as to present neither an isolated nor a crowded appearance.

(50.) As regards the sizes of patterns in floors, it is to be observed that as they are always at the same distance from the eye they should always preserve the same scale. It is often desirable to lay out a large floor in such a manner that the effect of the whole design can only be appreciated from a gallery above; but in such a case it is better that the larger pattern should be made up of several subdivisions, each containing a complete design in itself, than that large patches of colour should be introduced, the meaning of which is unintelligible to those who walk upon the floor.

(51.) Patterns are usually set out before being placed *in situ*. A frequent method is to draw the design in reverse

upon stout lining-paper, and fill in the colours. Over this the marble tesserae are placed in their proper positions, being made to adhere to the paper with the aid of paste or glue, and being generally enclosed in a light wood frame attached to the paper. When the pattern is completed the whole is placed in its properly-prepared bed of mortar, and the paper is removed from the surface, after which the usual process of grouting, cleaning, and gritting is pursued. Sometimes a black bituminous mastic (§ 17) is used. Fine sand is spread upon a flat surface, upon which an empty frame of the requisite size is placed. Inside this the tesserae are so arranged as to form the pattern, the outline of which is previously traced upon the sand. The hot mastic is then poured into a kind of wooden tray, about three-quarters of an inch deep, and of the same size as the frame enclosing the pattern. The tray is reversed over the mosaic, and the mastic passes downwards, penetrating into the interstices between the tesserae, but is prevented by the sand from spreading under their lower surface, which is to form the front of the design. When the mastic has become hard, the mosaic is reversed, and placed upon a level bed of mortar thoroughly set and covered with boiling mastic to a thickness of about a quarter of an inch. When the latter has cooled down and hardened, the mosaic is retained in position. By such means the whole or any portion of a design may be set out and its effect criticised before it is fixed.

(52.) In forming patterns—and this applies to mosaic work in any situation—the tesserae in the ornament itself should run in directions parallel to the outline as nearly as possible, so that the effect may not be marred by an in-harmonious arrangement of joint lines. A single row of tesserae in the ground should also follow the outline, so that no joint lines may cut awkwardly against the leading forms. Both of these *desiderata* are illustrated in Fig. 6.

(53.) The impropriety of walking over a picture has been generally acknowledged ever since the publication of Pugin's *True Principles*, and it is, therefore, needless to protest against the introduction of pictorial subjects into

floors. Even with conventional ornament care should be taken to employ only that which can be viewed from any

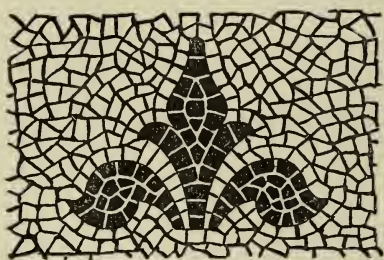


Fig. 6.

standpoint without presenting the appearance of being upside down. The same thing applies to geometrical patterns, which may, however, be made to express direction, while perfectly symmetrical in their parts. To explain this more fully, any pattern may be said to express direction, which is composed

of elongated forms placed end to end and ranging in parallel lines, or where the colours are so disposed in any regular pattern as to give the effect of continuous

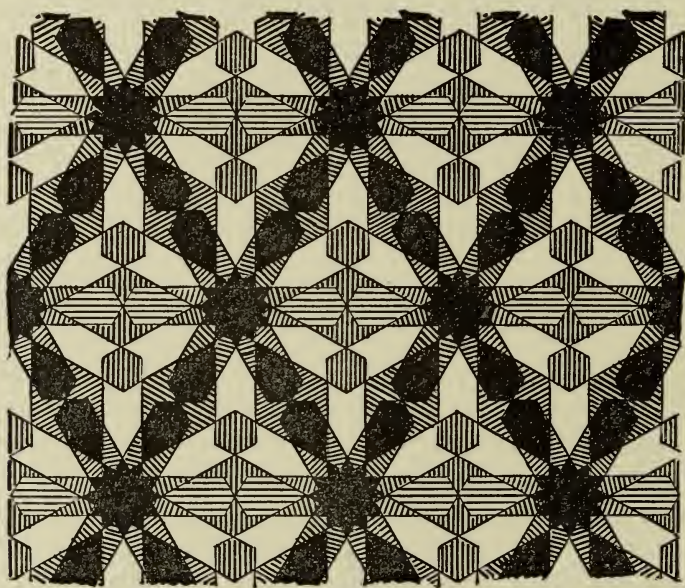


Fig. 7.

parallel lines. The patterns shown in Figs. 1, 3, 7, and 9 all express direction, while Figs. 4 and 10 do not, Fig. 4 giving the effect of repose very happily by an ingenious combination of straight lines and curves. In

designing patterns it is certainly easier to express direction than repose, because even when the forms are satisfactorily arranged it is often difficult to prevent the colours from falling into parallel rows. It is decidedly better in most floors to have patterns which express repose. Patterns expressing direction are proper enough in corridors, where the direction of the pattern should of course coincide with the length of the corridor. If an elongated pattern is employed in the floor of an elongated room, the length and breadth of the geometrical figures should be proportionate to the length and breadth of the floor-space measured within the border, and then it will be found that a satisfactory finish can be made at the corners.

(54.) Following still further the principle of avoiding pictures in floors, we should endeavour in the arrangement of colours to convey an impression of flatness, quite free from anything which may resemble an attempt at shading. The eye is not agreeably impressed by a floor pattern which seems to rise up in relief, as if offering impediments to the feet in walking. Fig. 8 shows a fragment of a border from a Pompeian tessellated pavement, in which the objectionable practice of shadowing has been deliberately adopted. The effect calls to mind some of the vulgar sorts of shop-lettering to be seen in London and elsewhere.

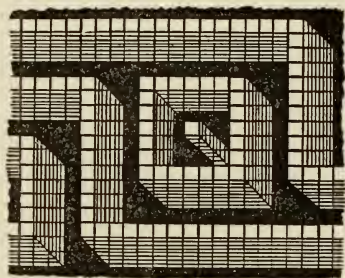


Fig. 8.

But the effect of shadowing will sometimes arise unintentionally, and is not always easily avoided. This is seen in the pattern, Fig. 9, from the Basilica of Santa Maria Maggiore. Here we have a series of rhombus-shaped slabs of porphyry and serpentine inlaid upon a ground of light marble, producing the appearance of a series of cubical blocks viewed anglewise. The crude simplicity of the pattern gives it an effect of tiresome monotony, notwithstanding which it has come into very common use. Fig. 10 shows another arrangement of the same materials,

the effect of direction, resulting in Fig. 9 from parallel rows of colours, being avoided.

(55.) Coming to the consideration of mosaic work as applied to wall surfaces, it may be remarked that here it is

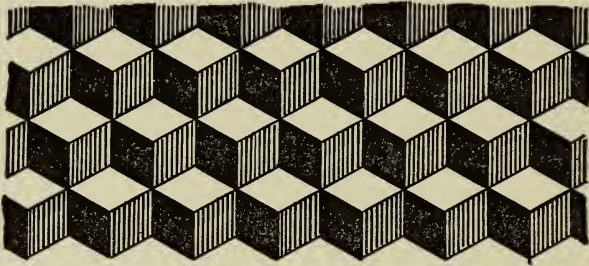


Fig. 9.

desirable that the pattern should be expressive of direction, either vertical or horizontal. If, for example, we have a long, low wall surface, we may wish to impart an appear-

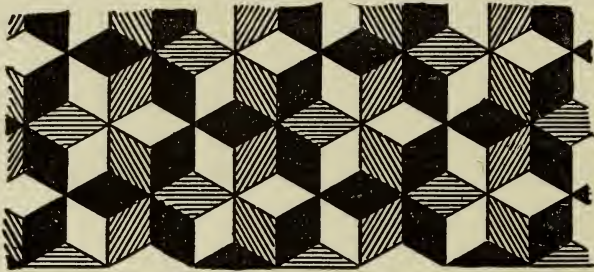


Fig. 10.

ance of height to it by an arrangement of lines expressing verticality. This could be done by the use of the pattern shown in Fig. 7, from the dado of the Hall of Justice in the Alhambra, of thirteenth century date. The black in the diagram represents dark blue, the other colours being pale blue, grey, green, and orange. These mosaics are formed with tiles, but there is no reason why they should not be reproduced in marble, a more limited range of colours being adopted. The pattern in Fig. 7, if turned sideways, would give apparent breadth to a wall surface considered to be too lofty or too narrow. Figs. 11 and 12, both from pavements in the Baptistery at Florence, afford

simple suggestions for producing similar effects. Fig. 11 would give breadth and Fig. 12 would give height to a wall surface. Fig. 12 might be applicable to inlaid marble columns, or to elongated panels in pilasters. But if we wish to give a marked character to wall as distinguished from floor decoration, we ought to employ in the former such ornamentation only as can be properly placed in a vertical position. Fig.

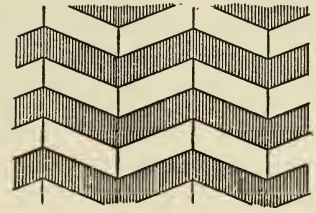


Fig. 11.

13, from the church of St. Anastasia, Verona, is applied to a floor surface, but it so plainly suggests an upper and an under side in its form that it seems best fitted for wall decoration. The colours are red and grey alternated with white.

(56.) The application of Roman tessellated mosaic work to walls allows greater freedom in the design of ornamental forms than can be obtained in any species of *Opus Sectile* or *Alexandrinum*. With Roman mosaic, gold and silver enamels are often used in conjunction with marble tesserae. These enamels are made by placing metal leaf upon a foundation of glass or enamel, and covering it with a thin layer of fine glass of uniform thickness, which may be plain or coloured, according to the effect which is desired to be produced. The



Fig. 12.

three substances are fused together by the aid of heat, and the whole must of course be of the same finished thickness as the marble tesserae to be used in connection with it. The enamel is also cut into the same average sizes as the marble, so that the

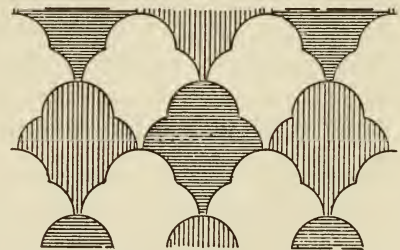


Fig. 13.

jointing of the whole may present uniformity of appearance. The cements used in jointing have been described in the second chapter (§ 27). It will be found

that dark-coloured marbles show to the best advantage against gold or silver mosaic, black marble, porphyry, and serpentine being highly effective. The gold or silver frequently forms a ground in which the ornament is inlaid with marble. Silver being more dazzlingly brilliant than gold, should be used more sparingly; and when we have a silver ground, the patterns upon it will bear to be inlaid with broader lines than upon a gold ground. Patterns suitable for panels and friezes are those which



Fig. 14.

are irreversible, like the Pompeian mosaic shown in Fig. 14, without being of too pictorial a character. Pictorial designs are often executed with several colours upon a gold ground; but when this is done it is necessary to

surround each mass of light colour with an outline of small black tesserae, to set it off against the background. The scope for variety is practically unlimited in the decoration of walls with mosaic work, but the general principles to be observed in connection with it are well summed up in the following extract from a paper read before the Royal Institute of British Architects by Mr. (afterwards Sir Matthew Digby) Wyatt, in 1862. According to this eminent authority, a well-devised system of mosaic should give "by predominant vertical lines height to a structure in which height is wanting, and by predominant horizontal lines, length where length is needed. Brilliancy may be wrought out of darkness by allowing gold grounds and luminous colours to prevail; while the eye in another building, 'faint with excess of light,' may be refreshed by a preponderance of cool and quiet tones. String courses and borders, archivolt and imposts, bands and friezes, should be treated as permanent frames to permanent pictures, essential, by their rectangularity or other simple geometrical character, to afford the eye a ready means of testing all adjoining and more complex forms by con-

trast. Need I say," continues the lecturer, "that where the skeleton of the picture's composition is tossed about in lively action, a stronger boundary of more vivid and contrasted lines must enclose it as a corrective, than when the motive power of the picture is a quieter and simpler structure. That is the reason why the great Venetian pictures require such massive framing, while the more serene compositions of the early Florentine and Sienese schools look best when separated one from another by little else than narrow bands of flat and softly tinted ornament. In the same way in mosaic, the rigid saints of the early Byzantine school, with their evenly-balanced limbs and perpendicular draperies, need little else than vertical palm-trees or inscriptions, or even upright staves placed between them, to keep them architectonic; while the later corresponding figures of the Italian school, with their swaying lines, require often actual insertion into niches to keep them even reasonably quiet."

(57.) Coves in marble mosaic are usually constructed with curved ribs of rolled L-iron, filled in between with concrete resting upon their flanges. The mosaic is set upon a backing of plaster worked to an even surface over the concrete. Gold grounds are much used in coves, with patterns in broad black lines. No pattern should be employed which is liable to be unpleasantly distorted by the curvature of the surface; and for this reason, curved lines are more appropriate than those which, following rectangular forms, are more fitly applicable to flat surfaces. Similarly, no pattern should be employed in a cove which is obviously suggestive of verticality. Thus, for instance, representations of hanging swags, festoons, or garlands, which would naturally fall into a drooping posture if suspended against a wall, are generally admitted to be out of place in a cove, as they are in a ceiling; and figure subjects should be avoided for similar reasons. The same observations apply to the decoration of domes; and it may here be added with reference to figure subjects in any situation, that when the figures are larger than life, they always dwarf the apparent size of an interior, because

we unavoidably suppose them to be smaller than they actually are. The kind of mosaic ornament which seems



Fig. 15.

are applied. Fig. 15 shows an Indian pattern which, it is suggested, might be adapted to the decoration of a mosaic



Fig. 16.

cove, or employed in zones or bands of ornament around a dome. Some of the well-known intertwined scroll ornaments of the Italian Renaissance would be equally appropriate for such purposes. Fig. 16 shows an ornament from a Greek vase, which might be employed in the decoration of a domical ceiling, the ornament being worked into the interspaces

between ribs and zones of a more formal character. I have purposely selected Fig. 16 from a vase, because being originally deemed suitable for a curved surface, we cannot go far wrong in applying it to a dome.

(58.) Mosaic work may be applied to flat ceilings, the patterns being first set out, and afterwards placed in position. The ceiling is usually beneath an ordinary fireproof floor constructed with rolled iron I or L beams, having concrete filled in between them. The mosaic work may be laid in mortar upon $1\frac{1}{4}$ -inch or $1\frac{1}{2}$ -inch slabs of slate, and rubbed down and polished to the requisite degree. A margin is left at the side of each slab, to allow for a bearing upon the flanges of the iron beams, which can be laid at five or six feet apart. Fig. 17 shows a section through the bottom flange of the beam, with the slate slab, which

forms the backing to the mosaic resting upon it. The iron is concealed by a $2\frac{1}{2}$ -inch moulded marble soffit, having lewis-holes sunk in its upper face at from one foot to eighteen inches apart. Brass bolts of $\frac{3}{8}$ -inch diameter are let into the lewis-holes and run with lead, and being passed through holes drilled in the iron flange and in the slate above, are secured by means of screw-nuts. The space between the soffit and the mosaic

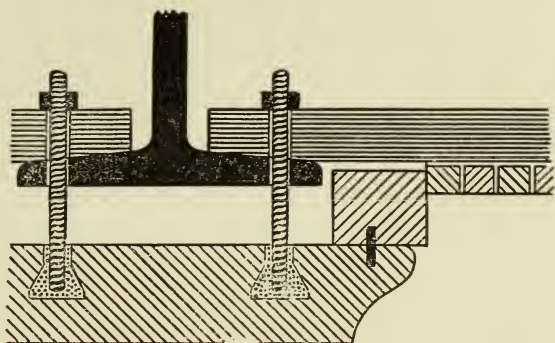


Fig. 17.

work is occupied by a plain marble facia which takes its bearing upon the former. Concrete, if required, is laid upon the slate slabs.

(59.) Little need here be stated with reference to the appropriate treatment of flat ceilings in mosaic work. It is maintained that pictorial decorations ought only to be placed where they can be seen to the best advantage—that is, against vertical wall faces. The arrangement of ceilings should be similar to that of floors, as regards the expression of direction and of repose, as already stated (§ 53), and also as regards avoiding the appearance of relief resulting from artificial shadows (§ 54). But with reference to the sizes of patterns, these will be governed by their distance from the eye, which will differ in different cases. Lightness in general tone is essential in a ceiling, if only from the practical necessity of making it reflect as much light as possible upon the room below; and light colours should therefore predominate in ceilings, as dark colours should in floors.

CHAPTER V.

MARBLE LININGS AND BOXINGS.

(60.) BESIDES mosaic, there are two distinct means of decorating the surfaces of buildings with marble, both of which are described in G. E. Street's "Brick and Marble in the Middle Ages," as having prevailed in Italy. The first method was that practised in Venice, and consisted in veneering brick walls with thin slabs of marble. In the other, practised at Bergamo, Cremona, and Como, the marble formed a portion of the substance of the wall. "These two modes led," observes the author, "to two entirely different styles and modes of architecture. The Venetian mode was rather likely to be destructive of good architecture, because it was sure to end in an entire concealment of the real construction of the work; the other mode, on the contrary, proceeded on true principles, and took pleasure in defining most carefully every line in the construction of the work. It might almost be said that one mode was devised with a view to the concealment, and the other with a view to the explanation, of the real mode of construction."

(61.) With the objections against the practice of veneering, I shall deal presently. As for the method of explaining construction by the use of solid marble blocks, as described, it is needless to state that effects of great beauty combined with architectural truth were obtained by it in Italy. The colours of the marble were alternated in horizontal bands, sometimes of equal widths, and at others with narrow courses of white marble between broader ones of dark colour. In the voussoirs of arches similar alternations of colour were pursued, and sometimes

straight lintels were formed with a number of stones differing in colour, ingeniously keyed together. This mode of marble decoration is of course far too costly to be adopted to any considerable extent amongst us, and we are compelled, in the majority of cases, to resort to the Venetian method, which adapts itself very conveniently to the purposes of internal decoration, and enables us to do full justice to the materials employed. The beauty of coloured marble can only be properly appreciated when it is seen in large masses. When it is cut into the average sizes of ordinary building stones, and bonded into a wall like ashlar work, we lose the majesty of effect resulting from a single polished slab of large dimensions, such as we can only have in veneered work.

(62.) In veneering brick walls with marble, the slabs are rarely less than $\frac{3}{4}$ of an inch thick, although the Romans are said to have veneered with $\frac{1}{4}$ -inch slabs in the baths of Caracalla. A space of $1\frac{1}{2}$ inch is usually allowed from the surface of the marble to that of the wall, to include the backing of plaster (§ 21) and any slight irregularities in the wall surface. As marble suffers greatly from the disintegrating influence of damp, the slabs should not be fixed until the walls are thoroughly dry. Open spaces should be left, where possible, between the marble and the wall; and with this object it is better for the backing to be laid in narrow vertical strips, so spaced that each slab may rest against at least two of the strips. If there is any doubt about the wall being dry, open joints should be left in the marble work for some time, so as to admit of a free circulation of air behind, and prevent condensation. The best fixing is obtained when a slab can be inserted between two projecting string-courses of solid marble built into the wall. Grooves, or rebates, are cut in the upper and under sides of the string-courses to receive the slabs, and the groove receiving the upper edge of each slab should be deep enough to allow sufficient "play," so that the slabs may not be crushed or injured in the event of any settlement in the wall behind. Vertical or horizontal joints between slabs are usually tongued with copper or galvanized iron. As a rule, linings have to be fixed where

there are no string-courses to give them support, and they are then secured to the walls by means of small metal wall-hooks. These hooks are made to grip the slabs by passing into small sinkings in the top, bottom, and side edges of the latter. The slabs are notched out at the back so as to enable them to close with a neat joint in front, while allowing for the thickness of the metal hooks. Staples, or bars of metal hooked at both ends, are often used for securing slabs of marble to solid stone backings. The slabs themselves are jointed together with plaster of Paris or Keene's cement (§ 22).

(63.) Hollow piers or pilasters are constructed with marble slabs $1\frac{1}{2}$ inch or more in thickness according to size, and tongued at the angles with copper or galvanized iron. Beads or ovolos are usually worked upon the arrises, or else the slabs are finished square at the edges, so as to form a simple lap joint, showing a double arris, no attempt being made to deceive the eye by an invisible angle-joint. The angles are usually strengthened by means of gusset-shaped blocks of any cheap freestone, fixed inside with plaster or cement. In constructing a boxed enclosure to an iron stanchion, large blocks of stone may be used, which can take their bearings upon the feathers or cross-flanges of the stanchion.

(64.) It will be understood that extremely careful workmanship is necessary in fixing marble linings, so as to avoid injuring the edges of the slabs. Great accuracy is requisite in cutting them to the proper sizes, and in setting out the work before it is fixed. It is as well that the hooks and staples used in fixing should be so arranged as to afford independent support to the slabs, and prevent them from being subjected to any undue pressure.

(65.) In the work previously cited, Street has drawn attention to the necessity of using marble veneer purely as a decorative covering, and objects to its employment as an apparently structural material. "There appears to me," says this writer, "to be a certain limited extent to which we may safely go in the way of inlaying or incrustation; we may, for instance, so construct our buildings as that there may be portions of the face of their walls in

which no strain will be felt, and in which this absence of strain will be at once apparent; obviously, to instance a particular place, the spaces enclosed within circles constructed in the spandrils of a line of arches can have no strain of any kind. They are portions of a wall without any active function, and may be safely filled in with materials the only object of which is to be ornamental. All kinds of sunk panels enclosed within arches or tracery would come under the same head; the spaces between string-courses might also do so very frequently, if, as in old examples, the string-courses were large slabs of stone bedded into the very midst of the wall, and so capable of protecting the thin weak slabs of marble incrustated between them. In Venice we have some grand examples, at St. Mark's, of this system of incrustation filling in the whole of the space within large arches; here it is lawful, because there is no weight upon it to thrust it out of its place or disjoint it, as the least pressure most certainly always will. So far in praise of the Venetian system. But in other parts of the same building we have this system carried to a length which I cannot but think most mistaken, and which, I most heartily trust, may never find imitators here. In these the arches were constructed in brick, and then entirely covered with marble. Of course there was some difficulty in doing this, and the way in which the difficulty was met was extremely ingenious. A succession of thin slabs of marble was placed round the soffit of the arch, having perhaps enough of the cohesion given by the form of the arch to enable them to support their own weight, and further supported by metal staples let into the joints of the brickwork. The edges of these thin slabs projected sufficiently in advance of the face of the brickwork to allow of their being worked with some kind of pattern—generally, as has before been said, a sort of dentil—and of their giving some support to the thin slices of marble with which the walls were then covered. The whole system was excessively weak, and this can nowhere be better seen than in the Fondaco di Turchi, where almost the whole of the marble facing and beautiful medallions, in which it was once so rich, have peeled off, and left no-

thing but the plain and melancholy substratum of brick."

(66.) But the remarks quoted above will apply, with almost equal force, against marble veneering of any kind which is held in position mainly by metal wall-hooks and staples. Such a wall-covering cannot be of such a permanent character as the wall itself, any more than tiles, woodwork, plaster, or any other decorative covering with which we may clothe the nakedness of a brick wall. We cannot afford to abandon a method of architectural decoration simply because the building to which it is applied may outlast its decay. On artistic grounds some exception may be taken to the use of marble veneer, not when it conceals, but when it imitates construction. When, for example, we have the walls of a room lined with small-sized rectangular slabs of marble, carefully arranged so as to break joint on the face; when the joints are concealed at the arrises instead of being allowed to show as quirks or rebates; when, in short, every effort is made to deceive the observer into imagining that the walls are constructed with blocks of solid marble—the whole system of decoration may be denounced as a piece of false art, quite as objectionable as the marble-block wall-papers which we occasionally see. But in the right use of marble-veneer there need be no attempt at deceiving the eye. With the use of slabs too large to be mistaken for solid blocks, and with the long vertical joints necessitated in panelling with variously-coloured marbles, we follow a treatment distinctly non-constructional. When we have a marble with

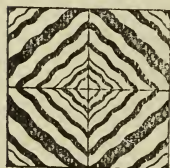


Fig. 18.

any decidedly marked pattern in it, we can saw it into thin slices, and by reversing these and placing them in juxtaposition, as shown in Fig. 18, we can obtain very beautiful effects in a perfectly legitimate manner. A panel of this kind tells its own tale at once. The four sections composing it cannot consist of entire separate blocks, and they are put together without any attempt to break joint.

(67.) It may be as well to remember that in veneering

walls with marble we are not restricted to vertical and horizontal jointing, and that the more we use our freedom in departing from this, the more purely decorative and non-constructional does our work become. An example of this kind of work is shown in Fig. 19, being the elevation of a spandril filling-in to the arches in the Ducal Palace in Venice.

Here, according to Mr. Ruskin in "*Stones of Venice*," there is a depth of two inches roughly hewn between the

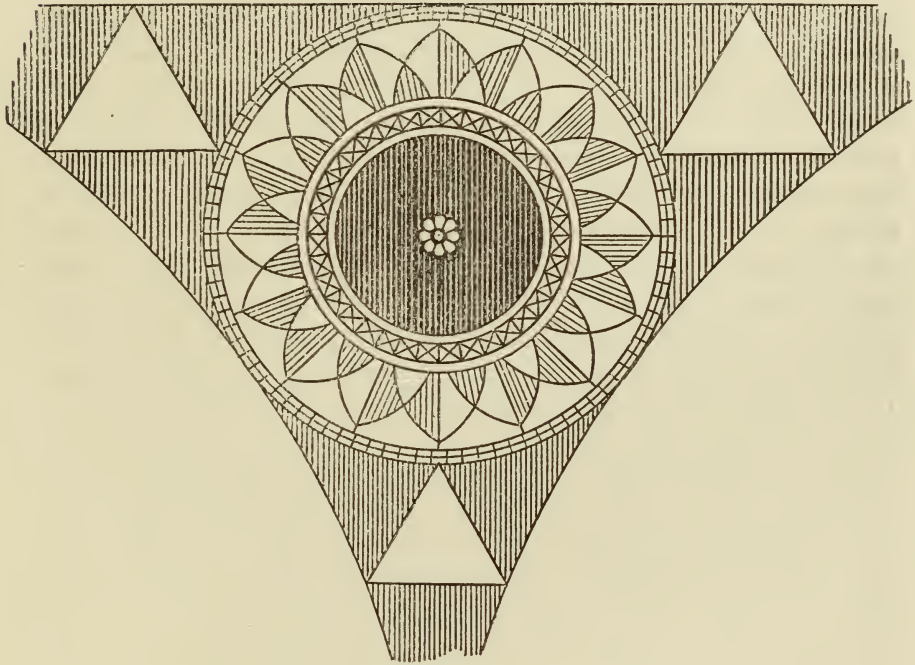


Fig. 19.

arches, to receive the marble slabs. The spandril shown in Fig. 19 has a central disc of green serpentine; the dark portions of the leaf-like ornament outside it are in grey marble; the dentil-band forming the larger circle is in a coarse, sugary marble, believed to be from Greece; the portions charged with the three white triangles are in red Verona marble; and the remainder of the design is in white marble. The extreme diameter of the larger circle is 3 feet 10½ inches, its field being slightly raised

above the level of the spandrils outside it. It is clear that we have here a kind of large mosaic work, which needs the juxtaposition of mouldings to keep it in scale with its surroundings.

(68.) Mouldings are generally necessary to emphasize the lines of panel decoration. A moulding may be run upon the edge of a marble stile; but if the marble be of any decided pattern, the veins or other marks cutting across the lines of the moulding will greatly detract from its effect. Moreover, what is needed in the majority of cases is a separate boundary of colour between the two surfaces. The stile being darker than the panel, the moulding should be in a darker material than either; and with panels in strongly coloured marble, black mouldings become necessary. In panelling we have a form of decoration eminently suitable for execution in marble, because it affords excellent opportunities for displaying the beauty of the material. The form of a panel should, when possible, bear some relation to the position in which it is placed. A ceiling panel should be symmetrical, but a wall panel may have an upper and an under side, that is to say, it may have an arched or cusped head, or its upper corners may be taken off with quadrant or other forms, to show that it is specially designed for no other than a vertical surface. A similar treatment may be applied to the side panels of ceiling beams, in contradistinction to their soffits. Marble ceiling slabs may be hung up to the flanges of iron beams with lewis-bolts, as shown in Fig. 17 (¶ 58), or if thin slabs are used, the bolts may pass through, and be fitted at their lower ends with ornamental pateræ in polished metal, or bronze; in which case, of course, the bolts must be disposed at regular intervals, bearing an appropriate relation to the general design of the ceiling.

(69.) One way of exhibiting the beauty of marble in the form of panels consists in employing very thin slabs for windows in place of glass. Oriental alabaster and Algerian and Mexican onyx are suitable for this purpose. If exposed to the weather, it would be prudent to protect the outside with glass. The fluor spars of Derbyshire exhibit the greatest beauty and variety of colour when

light passes through them ; but to render them durable, it is recommended that they should be mounted upon plain glass and rubbed down very thin, like microscopical sections, after which glass should be placed over them to prevent the condensation of moisture upon their surface, which would otherwise rapidly impair their beauty. The above-named process was recommended by Mr. W. Brindley, F.R.M.S., in a paper read by him before the Royal Institute of British Architects, December 20th, 1886, on "Marble : its Uses as suggested by the Past."

(70.) With reference to veneering applied to arches, as a matter of fact this is very seldom done with small arches of sudden curvature, because it is generally found that the extra labour involved in shaping and fixing separate archivolts and soffits is no saving upon the cost of executing the whole in solid work. Arches of slight curvature, however, as well as beams, are often veneered with marble. Moulded archivolts or architraves, as the case may be, are connected with curved or straight soffits, and fixed in the same manner as wall linings. Marble casings to iron beams or girders have blocks or cores of stone, resting upon the iron flanges, and cemented to the back of the marble work at convenient intervals. It may be urged that this is a system of decoration which is opposed to all true principles of architectural design ; and certainly few things can be more incongruous than sham arches, sham lintels, and sham beams, all carefully constructed in thin slabs, and hung up in the air in imitation of solid work. But the right use of veneer enables us to express in decoration a marked distinction between boxed and solid work. We can obtain the most beautiful varieties of effect by jointing together slabs of different kinds of marble, so as to present a strong contrast with the uniformity of solid work. Thus, referring to Fig. 17 (¶ 58), if the upright fascia be of a differently coloured material to the moulded soffit, no one will imagine that he is gazing up at a beam of solid marble, while full advantage will be derived from a judicious combination of colours. A similar treatment should be applied to boxed entablatures which form the enclosures to iron beams carried upon

marble columns. The ancients regulated the interspaces of their columns according to the structural nature of the stone or marble entablatures which they had to support. The use of iron beams enables us to place our columns at much wider intervals apart, and we ought not to offend the eye by producing imitations of solid marble beams applied to impossible bearings.

(71.) Flights of steps are often constructed in boxed marble. The treads are two inches or more in thickness, with moulded nosings, $1\frac{1}{2}$ -inch slabs being used as risers. The steps are usually supported upon raking beams of iron, the outer strings and soffits being formed with marble slabs and having suitable mouldings. In constructing such flights of steps, great care is often taken in matching the steps and risers, so that the steps may appear to be solid. But I contend that it would be far better if, in pursuance of the principles already advocated, the risers were made of a different marble from the treads, a more highly-coloured material being used for the former than for the latter. It is not expedient that the treads should be polished, because polish renders them so slippery as to be dangerous, besides which it becomes partially destroyed by constant use; but the full beauty of the marble risers may be brought out with the aid of polish, as is the custom in modern Belgian works.

(72.) There is scarcely any limit to the extent to which boxed work in marble may be used for displaying the variety of materials at our disposal; and yet the opportunities which it offers are constantly neglected in the manufacture of chimney-pieces, in each of which only one kind of marble is used, whether it be common or rare. Fig. 20 shows a simple application of boxed marble in a modern handrail or

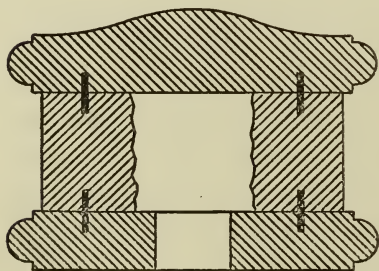


Fig. 20.

balustrade capping. The upper and lower slabs are of black marble, the sides being of bright red Griotte d'Italie.

The lower slab has square dowel-holes cut in it to receive slate dowels, which pass into the heads of solid marble balusters. The central space is filled with Keene's cement, in which a metal core may be imbedded for additional strength. The joints are tongued and cramped with copper.

(73.) Circular work in marble veneerings or casings is usually cut out of the solid, to avoid numerous joints, the appearance of which is considered unsightly. The advantage of large, unbroken surfaces is thus obtained, often at considerable expense. The Byzantine architects would seem to have studied economy more closely in this respect. In the mosque of St. Sophia, Constantinople, for example, portions circular upon plan are veneered with marble, cut into narrow strips, each presenting a flat surface, so that the whole is polygonal instead of curved. In some modern designs for boxed marble trusses, enclosing cantilevers of iron, the sides are in single slabs, while the soffit, being considerably curved in form, is made up of a number of small pieces all tongued together, and having a series of reeds or other small mouldings running transversely, with deep quirks between them, in which the joints are concealed.

CHAPTER VI.

MARBLE MOULDINGS.

(74.) THE use of marble for architectural purposes has had a perceptible influence upon the character of the mouldings wrought in it. The hard, compact nature of the material has rendered it possible to produce in it forms of much greater delicacy than could be executed in stones of coarser grain; and this delicacy of treatment has been usually unaccompanied by that boldness which has found scope in materials more easily worked. In the marble architecture of ancient Greece and Rome, and of mediæval and modern Italy, we find small mouldings executed with great precision, with sharp edges and narrow fillets; and we may notice a tendency to multiply members in cornices and other groups of mouldings. On the other hand, there is a general flatness of contour to be observed in the mouldings. We miss the bold, deep under-cuttings so common in the Gothic examples of this and other countries, where the softer kinds of stone have been so extensively employed; and we find that broad shadows are produced by the projection of entire members—as in the corona of a cornice, for instance—rather than by means of large hollows laboriously cut out. Some allowance must of course be made for climatic conditions. Boldness and severity of treatment naturally grew up in countries where the paucity of sunlight would not have displayed the contours of Greek and Italian mouldings to the best advantage. Yet it seems probable that the extreme hardness of the material did greatly influence those who worked in marble to adopt modes of treatment in which a *maximum* of effect could be obtained with a *minimum* of labour.

That this was so in the later Italian works is, I think, evident.

(75.) There is always much benefit to be derived from the study of Greek mouldings, not only on account of their forms, but of their adaptability to the situations in which they were placed. As regards form, their profiles usually followed the curves of conic sections. The result was that under strong sunlight, delicate gradations of shadow were produced, which cannot be obtained with mouldings whose profiles are formed from portions of circles. These gradations of shadow are specially appreciable when seen upon the surface of the white marble such as Greece produced and still produces. It is not merely a smooth, opaque surface like that of white plaster, but a surface alive, so to speak, with minute scintillations of light, and deriving in addition an almost luminous appearance from being partially translucent. If we polish this material, we find that the play of light upon the subtly curved surfaces of Greek mouldings gives us varieties of effect which are perpetually shifting and changing as we change our point of view. As regards situation, the Greeks paid the strictest regard, in designing their mouldings, to the aspects from whence they were to be seen; and mouldings placed above or below the eye were designed and worked accordingly. In illustration of these remarks, I give in Fig. 21

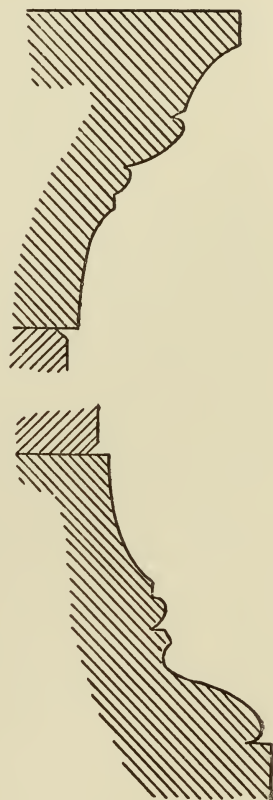


Fig. 21.

two sections of mouldings from a Greek tomb at Carpuseli, in Asia Minor. The architectural purport of these mouldings will be understood at a glance. Wherever strong lines of shadow are needed they are obtained by means of incised quirks or grooves; and where horizontal

joints occur these grooves are so arranged as to preclude the possibility of the marble grinding or spalling at its edges. The upper group of mouldings is above, and the lower group below the eye; and it will be seen that no portion of any moulded surface is out of sight. In fact, although the Greeks were not sparing of labour, they never wasted any; and it would be well if the principles upon which they worked could have been more fully understood by modern architects of the so-called "classic" school. An example of what to avoid may be instanced in the indiscriminate use of the "Attic base" for columns and pilasters. This base is an exceedingly beautiful composition in itself, but its principal feature is the *skotia*—a large inverted hollow which can only be properly seen below or on a level with the eye. Yet the architects of the Renaissance and their modern imitators have frequently employed this base in situations so far above the eye that only its two *torus* mouldings have been visible, the labour of forming the *skotia* being completely thrown away. No Greek would have committed such an architectural blunder.

(76.) The vast wealth and military supremacy of the Romans enabled them to force their vulgarised versions of Greek architecture upon the world. The profiles of their mouldings were portions of circles, drawn by a mechanical process instead of by the hand of the artist. In these mouldings we lose all those subtle gradations of shadow already noticed as obtained by the use of Greek mouldings. But such effects are less appreciable in polished than in unpolished marble. What we miss most in the Roman mouldings are the quirks which the Greeks obtained by the sharp turns given to their curves. The quirks just above the two echinus mouldings in the upper part of Fig. 21 do not occur in the Roman quadrant ovolo, nor is the quirk at the bottom of the lowest moulding found in the Roman ogee. The need for such quirks is greatly felt in polished work, where the amount of reflected light renders it extremely difficult to obtain any lines of shadow at all, especially in internal decoration seen by night, when light produced by artificial means is

shed from several directions at once. In some of the French Renaissance work we see this difficulty successfully overcome. Fig. 22 shows a section of the mantel and shelf of a marble chimney-piece in the Hôtel de Lauzun, Ile St. Louis, Paris. It belongs to the period of Louis XIV.—the middle of the seventeenth century. The bold cushion-moulding in the middle, with the deep quirk cut behind it, produces strong shadow lines which are plainly visible from a distance. At the same time it presents no appearance of coarseness upon a nearer view, because the extreme narrowness of the adjacent fillets gives scale to it. The works of these modern French architects will repay study. They exhibit judicious combinations of boldness and refinement; their authors appear to have imbibed the true spirit of Greek art, and to have worked in it with perfect freedom and with exquisite taste. In many of these mouldings we meet with undercut hollows which could not, without great difficulty, be worked by hand. Modern firms, however, frequently run their mouldings by machinery, by which extreme accuracy of outline is obtained. To avoid the necessity of working any portion by hand, the mouldings are usually mitre-jointed. This expedient, though more proper in joiner's than in mason's work, is not out of keeping with a purely decorative use of marble.

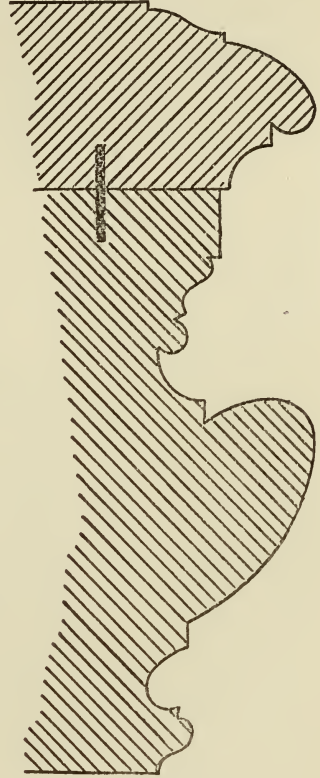


Fig. 22.

(77.) If we wish to see examples of economy practised in the treatment of marble mouldings, we may refer to the mediæval architecture of Venice. Here the architects appear to have realised the fact that the beauty of coloured marbles is best appreciated in plain surfaces; and their

mouldings are consequently few and far between. Fig. 23 shows two marble archivolts from St. Mark's; and their extreme simplicity contrasts curiously with the elaboration of form shown in Fig. 22. Throughout all these Venetian works in marble is noticeable a plentiful use of nail-head and dog's-tooth ornament, and of small splays. These are proper to the quasi-Gothic character of Byzantine work, and, as seen in the left-hand example in Fig. 23, were

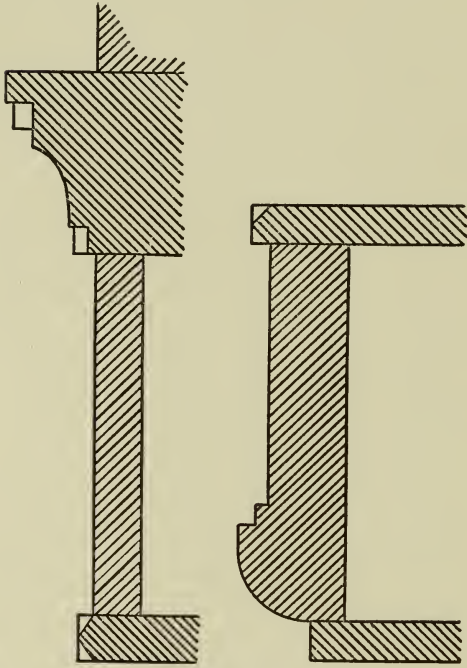


Fig. 23.

often worked upon the projecting edge of a soffit or lining to an arched opening — a truthful and legitimate method of treating boxed jambs and archivolts. Such kinds of ornament, requiring no great skill for their execution, help to increase the play of light upon the surface of polished marble by means of their numerous small facets cut at various angles. Splays, in fact, are as valuable for obtaining lines of light as grooves are for obtaining lines of shadow; and by these

two means alone, much that is effective in marble can be produced at a comparatively slight cost.

(78.) A highly characteristic form of Venetian enrichment is that which occurs in the outer circle of the spandril filling, Fig. 19 (¶ 67), of which Fig. 24 shows the detail. It will be seen to consist merely of a hollow and fillet, the width of the latter being one-half the entire width of the band, so that the junction line of the hollow and fillet is in the centre. The moulding is in short lengths, each length being alternately reversed, so that

the fillet is now on the outside, now on the inside of the circle. This ornament was often executed with a splay instead of a hollow, and when formed with bricks, the colours were alternated—a very simple means of producing a rich effect, equally applicable in marble.

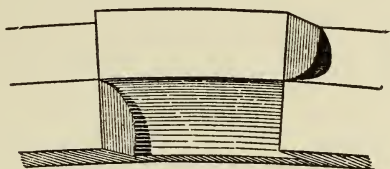


Fig. 24.

(79.) Enrichments of the class described above are about the most effective that can be executed in coloured marble; but they can never afford the same pleasure to the eye as carved ornament, and they become positively offensive if they are made too conspicuous. There is something crude—almost vulgar—in the appearance of a large nail-head or dog's-tooth ornament; and the reason for this is not far to seek. Accepting Mr. Ruskin's dictum, that the evidence of manual labour is one of the chief sources of value in ornament, we can understand why the eye is offended by a species of ornament produced by the very primitive process of chopping pieces of stone or marble into angular forms, conveying the impression that sufficient pains have not been bestowed upon the work. It was left to the Gothic school to borrow this barbaric style of decoration from Oriental sources. The "classicism" which Mr. Ruskin so strongly condemns, was free from this blemish, whatever its other defects may have been.

(80.) All kinds of splayed ornament are therefore to be employed cautiously, and not worked too large. Enriched mouldings, on the other hand, while highly appreciable in white marble, lose their effect when executed in any material of strong colour. Bearing in mind what can scarcely be reiterated too often—that the beauty of coloured marble is seen to the best advantage in plain surfaces—we ought generally to abstain from enriching our mouldings with carving. In many of the darker marbles, the effect of colour is so overpowering as to practically obliterate the forms of mouldings executed in them. This is especially the case with black marble, although the use

of black for mouldings is frequently necessary, as already stated (§ 68). Many an elegant black bedmould shows no more effectively than if it were a plain splay, for the deep shadows in quirks or grooves present no contrast to the depth of the marble itself, and the only diversity of appearance obtainable results from the high lights upon the polished surface.

(81.) Marble, whether light or dark, used for mouldings should be uni-coloured, and free from veins or markings, which destroy the effect of mouldings by crossing them with inharmonious lines. Mouldings to be enriched by carving should be either in white or very pale-coloured marble. A mode of enrichment occasionally practised in Venice and elsewhere consists in making incised patterns in mouldings, and filling up the sinkings with a kind of black mortar or mastic. By this means the contour of the moulding is preserved unbroken, while the effect of the ornament does not depend upon the varying influence of light.

(82.) Allied to the subject of mouldings is the shaping and general treatment of columns and pilasters. The Greeks, when their columns had bases, frequently gave the lower portion of the shaft and the mouldings beneath it a gently-spreading contour, like the base mouldings in Fig. 21, a treatment which seems to have been borrowed from the spreading bases of the Persian columns. Later on, as in Roman examples, we have the hollow or apophyges at the bottom of the shaft worked very small in a quadrant curve, so that the fillet in which it terminates projects like a thin circular plate around the bottom of the shaft. The same thing is noticeable in the apophyges and fillet at the top of the shaft, immediately under the necking of the capital. This was the kind of treatment pursued by the modern classical school of Sir W. Chambers, and it is too familiar to need illustration here. It gives us thin projecting rims of marble at each end of the shaft, which are extremely weak and liable to fracture; besides which there is a great expenditure of labour in cutting away from the face of the fillet to that of the shaft. The Gothic architects, on the other hand, worked their shafts without

fillets at either end, any fillet or other member which adjoined the shaft forming a portion of the cap or base. This is the method usually adopted in modern works in marble, chiefly with the object of economising labour and material. The Venetian architects of the middle ages made a quaint compromise between the Gothic and Classic methods, as shown in Fig. 25, from a base in St. Mark's. Here the extreme depth and slight projection of the fillet at the bottom of the shaft are at once favourable to strength and economy of labour. A similar treatment, though to a far less exaggerated degree, was pursued by the Florentine architects of the sixteenth century. The chief objection to be urged against the section in Fig. 25 is, that there is nothing but a joint line to show where the base ends and the shaft begins, a deficiency particularly evident when a marble of different colour is used for each.



Fig. 25.

(83.) In the fluting of columns and pilasters we have a valuable means of giving decorative expression to them. The straightness and rigidity of a vertical support are appropriately emphasized by a series of vertical lines, as exemplified in numerous Greek and Roman examples. Flutings, like mouldings and enrichments, are extremely effective in columns of white or pale uni-coloured marble. But in marbles of strong, dark colours, flutings become almost invisible when viewed from a short distance, especially if they are executed in polished work. Again, if the marble, whether dark or light in colour, has a pattern of veins or alternations of colour, the effect of flutings is to cause kinks or notches to appear in the veins or markings, and to destroy the continuity of the pattern. As a general rule, therefore, flutings in marble columns and pilasters must be pronounced undesirable. Two methods of treating pilasters suggest themselves as being suitable in marble decoration. One is by means of panelling, in

which the plain polished surface of the material appeals to the eye like a framed picture; and it is the most legitimate way of treating boxed pilasters. The other method, largely adopted by the modern French architects, is applicable to solid pilasters, and consists in working chamfers of varying widths upon them, the chamfered surfaces often following curved contours, and forming, in fact, a larger species of mouldings. This chamfering affords us the opportunity of cutting variegated marble in diagonal directions, and of thus obtaining variety in the effect of its pattern. The appearance of coarseness arising from broad chamfers is skilfully avoided by the French architects, in the subtle delicacy of the curves which they employ, and in the smallness of the fillets introduced.

(84.) If we have an uni-coloured marble, whether light or dark, used for columns or pilasters, we can give it all the decorative effect of fluting without breaking up the continuity of its surface, by inlaying it with a darker or lighter material. A black column may be inlaid with white or yellow marble, or a white column with black or any dark-coloured marble. A column of coloured marble may be most effectively inlaid with a material of the complementary colour. Thus, dark red may be inlaid with pale green, dark purple with yellow or orange, and *vice versa*.

(85.) Stone bands around columns appear to date their origin from the necessity of joining several shafts together. We see these features in Gothic work, where slender detached shafts are connected with the wall by means of stone bands, which are themselves portions of projecting wall-strings. The bands are usually narrow and of bold projection. In the works of the Romanesque and Renaissance periods, such bands were broad, flat, and of slight projection; and it will be found that in columns or pilasters of Classic or pseudo-Classic type, the projection of a band is easily overdone. The continuity of a marble shaft should not be broken by a band, unless it is necessary to join the shaft in separate lengths. It is also advisable that the band should be of a different material from the shaft, and should match the cap and base.

CHAPTER VII.

CARVED ORNAMENT.—CONCLUSION.

(86.) IF the careful selection of marble for moulded work is of importance, still more so is it for the productions of the sculptor's art. Pure white marble is the best for sculptured ornament; and failing this, the material should be of an even tint, free from veins or other markings, and as pale as possible, in order that the full value may be obtained from lights and shadows. It will further be found that in the majority of cases, delicacy of form is best appreciated in unpolished work. As with mouldings, so with carvings executed in marble, the nature of the material has almost necessarily produced a general flatness of treatment, while it has rendered possible an extreme delicacy of execution. It is now proposed to indicate some of the chief characteristics of carved work, and the lessons to be drawn therefrom. It may be remarked at the outset that, apart from representations of the human figure, carved ornament, regarded as an architectural accessory, may be broadly divided into two classes: that which is sunk below, and that which is raised above the general surface.

(87.) To commence with work of the former description, the simplest mode of carving applied to a flat surface is that so largely practised by modern French architects. It consists in producing scroll-like and other curvilinear forms by means of sunk lines or channels, and is equally applicable to polished or unpolished work. Provided that the sunk lines are cut sufficiently deep in proportion to their width to show as lines of shadow, they become more effective under a strong light than they would be if they were filled up with a black cement or mastic, as in the

enrichments described in the preceding chapter (§ 81). The next kind of sunk ornament to which I have to refer is the enrichment from the celebrated "Lily" capitals in St. Mark's, Venice, shown in Fig. 26. Here it may be

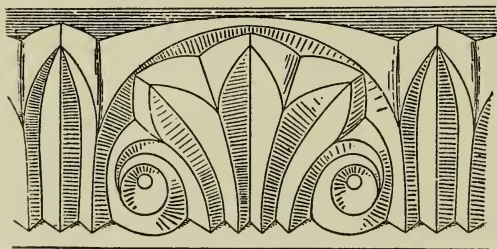


Fig. 26.

observed that in the sunk line-ornament mentioned above the design is produced in the sunk portions only, the forms of the intermediate surfaces being left to chance. In Fig. 26 it is hard to say whether the sunk or the solid portions follow the actual design. This rather rare species of ornament therefore occupies an intermediate position between that formed with sunk channels, and the more legitimate kinds of carving. As it consists entirely of splayed surfaces which catch the light, it is applicable to polished marble, and is effective at some distance from the eye, although it is wanting in those black shadows which are of great value in all carving.

(88.) Byzantine architecture, in which marble happens to have been extensively employed, is rich in examples of delicate carving sunk below the surface. As remarked by Fergusson, in his "History of Architecture," the governing line of the Corinthian capital was a hollow curve, having the acanthus leaves and other ornaments applied to it. This was suitable for columns placed at short distances apart, and only designed to carry a beam or entablature; but when used for supporting arches, it was found to be too weak. The tendency was, before the sixth century, to reverse the curve and incise the ornament; and this incised ornament was applied, not only to capitals but to mouldings, to pulvinated friezes, and to flat surfaces. In the mosque of St. Sophia, Constantinople, completed before the middle of the sixth century, nearly all the carving depends for its effect upon splayed surfaces. In most cases, the main portion of a leaf is depressed in a broad V-shaped channel, while smaller forms, such as the lobes

of acanthus leaves, consist each of two splayed surfaces rising up to a ridge along the middle. The greater portion of the carved work is thus as simple as that shown in Fig. 26. From an artistic point of view it cannot rank high, but it may be said that in it a maximum of effect is obtained with a minimum of labour.

(89.) In some of the later carving we find much more elaborate workmanship. In the Kakrieh mosque, at Constantinople, for example, there are foliated enrichments so deeply incised and undercut as to become almost detached, while the forms of the leaves are executed with a degree of refinement worthy of the best periods of the Renaissance. Some of the spandril carvings are actually perforated, the designs exhibiting slender stems arranged in spiral curves, and having only small leaves and pods, which play quite a subsidiary part. This kind of carving, in which the perforations occupy more space than the solid parts, can be most aptly compared with wrought metal work, which it closely resembles in its proportions. But it is to India that we must turn for specimens of pierced ornament in marble, in which there is evidence of the highest mechanical skill. Amongst works of a strictly Mohammedan character may be mentioned the perforated stone windows in the Jumma mosque at Beejapoor. These are slabs of a hard material, resembling marble, $1\frac{1}{2}$ inch thick, pierced so as to form interlacing geometrical patterns, the solid bars measuring about $\frac{3}{4}$ inch across, and the perforations in most cases being about three inches in average diameter. This work belongs to the latter part of the sixteenth century. In other instances, while the Hindoos had been converted by their Mohammedan conquerors, their art still retained much of its native vitality, and they produced in perforated screens exquisite carvings of more or less conventionalised foliage. Some of the finest work of this character is in the mosque of Seedee Syeed, at Ahmedabad. Here there are arched window-openings filled in with screens of perforated marble, having carved representations of trees with spreading branches intertwined in spiral curves and with innumerable leaves, many of which are disposed edgewise. The average width

of the interspaces is about $1\frac{1}{2}$ inch, and the work throughout is so delicate as to be comparable to carving in ivory. Servile regularity is not aimed at, one half of a design not being an exact repeat of the other half; but by an equal balance of parts an effect of perfect symmetry is obtained, which is the more charming because it appears to be the result of accident. The mosque, the greater



Fig. 27.

portion of which has been destroyed, is referred to the early part of the fifteenth century. Some idea of the character of the ornament mentioned may be formed from Fig. 27, which shows the upper part of a perforated panel from one of the niches in the mosque of Moohafiz Khan, also at Ahmedabad, and stated to have

been built in the latter half of the fifteenth century. The panel is about a foot in width. The leaves and stems are slightly rounded, and their resemblance to Gothic ornament is striking and interesting. In some of the other panels the forms are more of a flowing character, and would remind us of Flamboyant carvings.

(90.) It will be observed that in all perforated carvings a practical difficulty arises from the fact that no portion of the design can be detached from the remainder. The difficulty has been met in Fig. 27, by leaving here and there some small connecting pieces of marble, which, however, form no part of the design. The expedient is a somewhat clumsy one, and might easily have been avoided. The labour involved in such carving as this might seem rather formidable to the mind of an English mason, yet there seems to be no reason why perforated work should be altogether banished from modern marble decoration, as it seems to be at present.

(91.) With reference to the second class of ornament mentioned at the commencement of the chapter—that which is raised above the surface—probably the simplest kinds are those formed with bands or fillets in slight relief. Amongst these may be mentioned the well-known Greek frets and similar enrichments adopted by the Roman and Renaissance schools, and the interlacing ribbon-ornaments carved upon ancient stone Celtic crosses, and often reproduced with success in granite. Some of the simplest types of foliated raised ornament are the representations of the so-called “honeysuckle” and similar forms in ancient Greek art. The use of splayed channels in volutes and leaves was well understood, as may be seen from Fig. 28, which

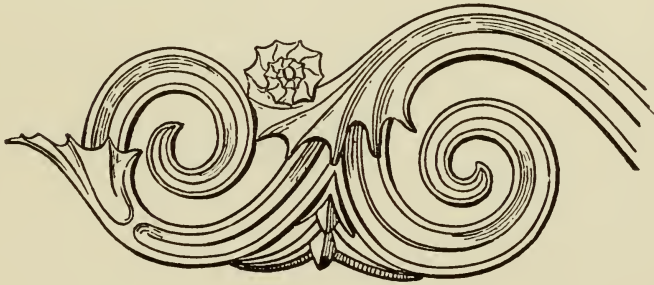


Fig. 28.

represents part of a carved truss from the foot of the terminal surmounting the choragic monument of Lysicrates. Here, as pointed out by Owen Jones in his “Grammar of Ornament,” we may observe a characteristic feature of Greek ornament, continued by the Romans, but abandoned during the Byzantine period, which is, that the various parts of a scroll grow out of each other in a continuous line. “What is evident,” remarks this author, “is, that the Greeks in their ornament were close observers of nature, and although they did not copy, or attempt to imitate, they worked on the same principles. The three great laws which we find everywhere in nature—radiation from the parent stem, proportionate distribution of the areas, and the tangential curvature of the lines—are always obeyed; and it is the unerring perfection with which they are, in the most humble works as in the highest, which

excites our astonishment, and which is only fully realised on attempting to reproduce Greek ornament, so rarely done with success."

(92.) The Roman carvings in low relief upon friezes and similar surfaces exhibited generally too great a redundancy of form, and the foliage, although conventional, was less so than that of the Greeks. There was often more leaf than stem to be seen, and the result of this was to make the leading forms of the designs difficult to distinguish from a distance. The Italian Renaissance work of the sixteenth century showed more of the spirit of Pompeian art, the natural forms being made subservient to the general composition of a design. Carving in low relief was for the most part framed in panels, beyond the external mouldings of which it did not project. Great delicacy of workmanship has been found possible in works of this kind executed in marble, the spiral-shaped stems in foliated ornament being sometimes of a threadlike thinness, and no portions throughout being undercut. The brothers Adam in the last century infused all the refinement of Greek feeling into carving applied to similar purposes; whereas modern French architects have rather travelled in the opposite direction, making nearer approaches to imitations of natural foliage, and often allowing their carved ornament to spread out over the mouldings of the panel containing it, as if it had outgrown its proper boundary. This shows an amount of licence which the severity of classic taste would strongly condemn; and it is difficult to see where such arbitrary transgressions of architectural principles are to cease when they once begin. The skill of the artist should find ample scope in designing ornament which will adequately fill any panel or other defined surface.

(93.) Many examples might be cited of carved ornament in marble which is partly detached from the surface, and of which the projecting parts are of extremely delicate proportions. Among the most familiar instances of this may be mentioned the carved leaves under the modillions of Roman cornices, and the overturned leaves in Corinthian capitals. But the most remarkable instances

are to be found amongst Hindoo works, as in the temple at Kirwuttee, which is supposed to have been built in the first half of the twelfth century. Here there are capitals in which there is much open carved work. Representations of plant forms, which are almost detached, and have slender stems resembling metal work in their proportions, are grouped in an irregular manner, as if literally growing over the architecture which they scarcely touch. The carving of these early Hindoo art workmen, who as yet had not come under the influence of Mohammedanism, is probably the most free and naturalistic in the world. I may add, what has often been stated before, namely, that the subject of Hindoo architecture is one deserving of much closer study than it has yet received from Englishmen.

(94.) Carved ornament in marble must in the present day be largely affected by considerations of economy. Probably face-work, whether sunk or raised, will, in the majority of cases find adoption in preference to anything which involves laborious undercutting. It is to be hoped that modern carvers will avoid imitating natural forms too closely in foliated ornament. It may be difficult to define the reasons why naturalistic carving is usually offensive to the taste of architectural critics. It may be that there is an agreeable impression of reserve power in the work of a carver who refrains from following nature closely, while he shows that he possesses the requisite skill to do so. Perhaps also the contrast between the stability suggested by architectural forms and the fragile character of natural foliage seems inharmonious when both are executed in the same material. Certain it is that the attempted imitation of natural forms in marble is one of the worst faults committed by monumental sculptors, who seem sadly in want of sound architectural training.

(95.) In concluding this little work, I have to thank the reader who has had the patience to follow me thus far. My labours might have been greatly extended, but the object has been to condense rather than to amplify. As works in marble are often executed by Continental workmen, who are familiar with the metrical system only,

the subjoined table of English dimensions and foreign equivalents will probably prove serviceable for reference in giving instructions or figuring drawings.

TABLE OF ENGLISH DIMENSIONS AND
FOREIGN EQUIVALENTS.

Inch.	Mètre.	Inches.	Mètre.
$\frac{1}{8}$	·00317	2	·05079
$\frac{1}{4}$	·00634	3	·07619
$\frac{3}{8}$	·00952	4	·10158
$\frac{1}{2}$	·01269	5	·12698
$\frac{5}{8}$	·01587	6	·15238
$\frac{3}{4}$	·01904	7	·17778
$\frac{7}{8}$	·02222	8	·20317
1	·02539	9	·22857
$1\frac{1}{8}$	·02857	10	·25397
$1\frac{1}{4}$	·03174	11	·27936
$1\frac{3}{8}$	·03492	12	·30476
$1\frac{1}{2}$	·03809	24	·60953
$1\frac{5}{8}$	·04127	36	·91430
$1\frac{3}{4}$	·04444	48	1·21906
$1\frac{7}{8}$	·04762	60	1·52383

APPENDIX.

TERMINOLOGY OF BRITISH AND FOREIGN MARBLES.

Acajou.—This term, the French equivalent for mahogany, is applied to a marble exhibiting undulating bands of reddish brown. It is quarried at Mirecourt, in Vosges, France. See *Rouge Acajou*.

Affumicato.—This marble, named thus on account of its smoke-like pattern, is grey mingled with shades of brown. It is quarried near Trescore, Italy.

African Antique.—This beautiful antique marble is a breccia, having a black ground with large spots of greyish white and deep red, sometimes inclining to purple.

Agly.—The marbles quarried in this valley, in the Eastern Pyrenees, France, are of the puddingstone order, with spots of red, brown, green, white, and grey.

Ain.—The department of Ain, France, produces several marbles, including white, grey, and rose-coloured varieties; a lumachello marble, showing bluish grey and pinkish spots; and another of crystalline white, with fossil shells. Marbles somewhat resembling this latter are called *St. André* and *Villebois*, after the names of the quarries.

Ain Ouinkel.—This marble, named after its quarry in Oran, Algiers, is of a deep reddish brown, tending to greyish brown, with black veins. It takes a good polish.

Alabaster.—This material, sometimes called bastard alabaster or *Biscuit de Florence*, is a sulphate of lime which does not immediately effervesce under acids. Its proper name is gypsum, and it must be carefully distinguished from *Oriental Alabaster*, which see. Alabaster is not a marble, although it will take a fairly good polish. It is mostly pure white. In England the best kinds are obtained from *Droitwich*, in *Worcestershire*; *Orston*, near *Grantham*; the neighbourhood of *Newark-on-Trent*; *Fauld*, near *Tutbury*; *St. Bee's Head*, *White-*

haven; in Staffordshire and Nottinghamshire; at Alston, in Cumberland; in the neighbourhood of Watchet, in Somersetshire; and in the Isle of Purbeck, Dorsetshire. Irish alabaster comes from Carrickfergus, in County Antrim; from Carrickmacross, in County Monaghan; and from the banks of Lough Allen, County Leitrim. A variety occasionally tinged with red, grey, and dark blue, is found at Bêx, in Switzerland; at Osterode, Ilfeld, and Walkenreid, in the Harz; at Mansfeld; Magdeburg; Sulz, on the Neckar; Lüneburg, in Hanover; Segeberg, in Holstein; Hall, in the Tyrol; Hallein and Auszee, near Salzburg; Berchtesgaden in Bavaria; Vic, in Lothringen; and at Bochina, and Wieickzka, in Galicia. In France it is found at Aix and Auvergne, and near Salins and Lous-le-Saurier, in the department of the Jura. In Spain it is found at Cervetto; Castelnau de Durban; San Jago de Compostella; Paredes, in Guadalaxara; Conillo, near Cadiz; and at Teruel in Aragon. In Italy the best alabaster comes from the Val de Marmolago, near Castellina; and there is also a very fine variety quarried at Volterra. Yellowish and red varieties come from Monte Catini; and a mottled kind, resembling granite, comes from Carrara. In Tuscany, white alabaster occurs at Miemo, and in Piedmont, at Aosta. In Canada there are extensive quarries of workable alabaster on the Grand River, between Cayuga and Paris. In the United States pure white alabaster occurs near Lockport, at Camillus and Manlius, New York, in Davidson County, Tennessee, and elsewhere. Mammoth Cave, Kentucky, and the neighbourhood of Syracuse are other sources, as well as Ohio, Illinois, Virginia, and Arkansas.

Alberese.—This Italian word, signifying dendritic, or tree-like, is applied to those landscape or ruin marbles which exhibit patterns resembling trees, and sometimes fragments of ruined buildings. Alberese di Riguano, named after the locality of its quarry, is of a yellowish white, with small black specks and lines, forming tree-like patterns. Alberese di Vichio is similar but with more numerous lines and specs. Both these marbles resemble Alberese di Mugnione. See Mugnione.

Alcino.—A variety of marbles are quarried near this mountain in Tuscany. A brocatello has a dark violet ground with interlacing white veins. Another marble is black with white veins. Another is black with white spots, and resembles a breccia.

Alentejo.—The marbles quarried at this locality in Portugal comprise a fine yellow marble called Alentejo, which resembles

yellow Sienna, and some brocatellos and breccias having a yellow ground.

Aleppo Breccia.—This marble has a yellowish green ground, with spots of green, white, yellowish red, violet, olive, and brown, with pale grey veins traversing the spots. It is very rare, and is obtained from Saravezza and from Fourni, in its neighbourhood, in Piedmont. It has sometimes been confounded with a breccia quarried at Alet, in France, “Brèche d’Alep,” being easily mistaken for “Brèche d’Alet.” See Alet Breccia.

Alet Breccia.—This marble, called by the French “Brèche d’Alet,” is quarried at Alet and at Tolouet, near Aix, in Provence. It has a rich, yellowish brown ground, with red and grey spots. It is sometimes confounded with Aleppo Breccia, which see.

Algerian Alabaster.—See Oriental Alabaster and Onyx.

Ampus.—Jaune d’Ampus is a yellowish marble quarried at Ampus, in Var, France.

Angers.—Three varieties of marble are quarried near this locality, in Maine-et-Loire, France. One is grey veined with white; and another is grey mingled with violet, and a third is black.

Anglesea.—See Mona.

Anis d’Any.—This marble, named after its quarry in Aisne, France, has a grey ground with black dots. It is rather soft.

Antique African.—See African Antique.

Antin.—This marble, quarried at Veyrette, in the Upper Pyrenees, France, is red with yellow veins. For Vert d’Antin see Veyrette.

Appisson.—In the Vallon d’Appison, in Lot, France, is found a brownish yellow marble with black and brown veins, which takes a good polish.

Arc.—This marble, quarried near Arc-sur-Till, in Côte d’Or, France, is of two varieties. One has a ground of reddish yellow spotted with deep red, and the other has a ground of brownish amber-yellow with flesh-coloured spots.

Arcy.—At the Grottes d’Arcy, in Yonne, France, a pale yellow lumachello with grey and white crystalline fossils, and a bluish grey lumachello with white fossils, are found.

Ardese.—This is a grey marble dappled with white and brilliant red. It is quarried at Bergamasque, in Italy.

Ardinghen.—This name is given to a marble quarried at this locality, in Pas-de-Calais, France. It has a reddish ground speckled with white. Other marbles quarried here comprise

Sanguin, having a ground of greyish white with thin veins of blood-red, and **Ruban Bleu**, having a similar ground intersected with bluish white ribbons or bands.

Argentré.—The marbles quarried at Argentré, near Laval, in Mayenne, France, comprise black specimens, and greyish white marked with red.

Argonne.—The marbles quarried in the forest of Argonne, at Verdun, Avocourt, Rubreville, Parois, Brocourt, and at Rampont, in Meuse, France, are called *Lumachelle des Argonnes*, *Pierre Chaline*, or *Racine de buis*. They consist mostly of blackish fossils united in a ground of bluish grey. Some varieties are tinged with yellow and reddish hues, and all have a tendency to turn yellow on exposure. These marbles are very compact and take a good polish.

Arlecchino.—This is an antique marble, also called *Seme Santo*. It exhibits a ground of variegated red and white with spots resembling seeds.

Arlequin Breccia.—See *Brecciato Tracagnina*.

Arles.—See *Statuary*.

Armagh.—The marbles quarried near Armagh, in Ireland, comprise the cream-coloured, which is also found at Cheevy, near Dungannon, and a variegated marble having different shades of light red tending to purple, brownish yellow, and dove-colour.

Arno.—The marbles found near the banks of the Arno, in Italy, comprise several varieties. A *giallo brecciato* is a brecciated marble exhibiting several shades of yellow. A *tigrato* is yellow with black specks. A *pillora del fiume* is similar but with veins. *Giallo con frappo di Arno* is similar but with large yellow bands. *Giallo liniato di Arno* is yellow with fine bands of deeper yellow. *Caia di pillora* is yellow, in several shades, with spots and small specks of black. *Fiorito di Arno* is yellow in varied shades, presenting tree-like patterns formed with minute black specks. A marble called *pillora di Arno* is greenish yellow with pinkish veins and black specks. *Liniato di Arno* is of an olive tint, marked like the grain of wood and with reddish brown spots. *Breccia con frappa di Arno* is of a similar colour, with reddish patches resembling mountains. *Nuvolosa di Arno* is pale green with spots of clear yellow, the colours being sometimes intermingled. *Scuro di Arno* is white with reddish veins. *Bianco di Arno* has a reddish white ground with black bands and specks. *Rosso fiorito di Arno* is deep red, veined in several shades and sprinkled with small

black specks in tree-like forms. Garatonio has a red ground with veins of a golden tint, and is much esteemed.

Arrenti.—A brocatello is quarried at Mount Arrenti, in Tuscany. It shows a mixture of green and violet, and is as hard as porphyry.

Ashburton.—A dark mottled marble, quarried at Ashburton, Devonshire, has a ground of dark, warm grey, with fine red markings and pinkish white veins here and there.

Ashford.—The marbles quarried at Ashford, in Derbyshire, include the finest black marble found in the United Kingdom, and the kind called rosewood. The latter is a dense brown laminated limestone, with a pattern resembling the grain of rosewood. It is only obtainable in small sizes, and is chiefly employed for small articles and for inlaid work.

Assynt.—The marbles quarried at Assynt, in Sutherland, Scotland, are white, bluish grey, and dove-coloured.

Augray.—A marble quarried at this locality, in Isère, France, is black with white fossil spots.

Avorio.—See Giallo Antico.

Aynac.—This is a reddish marble, named after its quarry, in Lot, France. Varieties of the same kind are found near Livernon, La Capelle, Marwal, St. Céré, and elsewhere.

Babbacombe.—Several marbles are quarried at Babbacombe, in Devonshire. One, found in small quantities, exhibits varied shades of light brownish red, resembling the colour of Spanish mahogany, with small bluish grey spots. A similar marble is found at Ipplepen, near Totnes. Some of the Babbacombe marbles resemble red granite in general hue, but with large veins of white, grey, and dull pink. Some are of a dark greenish grey with white and yellow veins. Others exhibit patches of pinkish grey, small spots of pink and grey, rays of pale grey and yellow, and a thin network of dark red veins. See Devonshire.

Bagny.—A marble quarried at Bagny, in Ain, France, has a reddish ground with white and yellow spots.

Baixas.—This marble, named after its quarry, in the eastern Pyrenees, France, and also called Brèche de Portugal, or Las Fous, has a ground of ash-grey, sometimes brown, with white crystalline veins.

Ballaculish.—The marble quarried at Ballaculish, in Inverness-shire, is of a beautiful ash-grey, of uniform grain, and takes a high polish.

Ballinahinch.—A marble found at this locality, in Ireland,

exhibits varied shades of light green, with brown and greenish white markings.

Ballykiloboy.—The marble quarried at this locality, near Waterford, in Ireland, is dark grey, with fossils embedded in it.

Balsieges.—A marble quarried at this locality, in Lozère, France, is white with red veins, and takes a good polish.

Balvacaire.—This marble, quarried at St. Bertrand-de-Comminges, in the Upper Garonne, France, has a greenish ground mixed with red and white. Some granites, exhibiting large and small fragments of white, grey, pink, red, green, and brown, are quarried in the same locality.

Bar.—The marbles quarried in the neighbourhood of Bar, in Aube, France, are mostly lumachellos, containing fossil shells. They exhibit various tones of mottled grey, and will take a high polish. Some varieties have a yellow ground with black or grey shell-spots.

Barbazan Breccia.—This marble, which is quarried at Cierp, in the Upper Garonne, France, is known there as Brèche de Cierp. It exhibits white, brown, and black fragments united together.

Bardilla.—This name, or bardiglio, applies to marbles of a blue or bluish grey tint. They are chiefly obtained from Vulpino, in the Milanese territory, and are sometimes called Vulpino marbles. A bardilla with blue and purple veins comes from Monte Silvestro, near Carrara, Italy. A kind called Bardiglio Fiorito comes from Montalto, in the mountain of Retignano, near Strazzema. Its veins, instead of being simply sinuous, run into flower-like forms. A fine grey bardilla is quarried at Onofrio, in Corsica.

Bardiglio Fiorito.—This is a variety of bardilla, which see. It is quarried near the torrent of the Rostonica, in Corsica. It is grey, veined with white, and is sometimes brecciated.

Barège.—Some marbles quarried near this locality in the Upper Pyrenees are white with grey and green interlacing veins. In some varieties the veins are pinkish.

Barga.—A marble quarried at this locality, in Tuscany, is black marked with white, with some reddish spots. A black marble is also found here.

Bariolé.—The French equivalent for variegated.

Basèdes.—A marble quarried in this locality, in Hainaut, Belgium, has a ground of black with grey spots and veins.

Bastard Alabaster.—See Alabaster.

Bathurst.—An albite is found at this locality, in Canada. It shows varied shades of pale green and grey, with a crystalline lustre.

Beaudean Breccia.—This marble is sometimes called Caroline Breccia, or in French, Brèche Caroline. It is quarried at Bagnères-de-Bigorre, in the Upper Pyrenees. It exhibits bright red, brown, and yellow fragments, closely united. See Sarancolin.

Beaujeu.—A marble of a dull, faded black, is quarried at Beaujeu, in the Lower Alps.

Beaume-la-Roche.—A marble quarried at this locality, in Côte d'Or, France, has a ground of olive green with blood-red spots and white marks.

Beaurecueil.—See Brèche Galifet.

Beauregard.—This marble, named after its quarry in Meurthe, France, exhibits combinations of red, yellow, and white, with fragments of pearly and crystalline lustre.

Bedouin.—See Puit-Réal.

Ballignies.—Marbles quarried at this locality, in the Nord Department, France, are uniform black, and black with small grey spots.

Bergamo.—The marbles quarried at Bergamo, Italy, comprise the black called Paragone, which is of a superior quality, and takes a high polish, and the breccia, which has a greenish grey ground with black and grey spots.

Betogh.—See Statuary.

Bianco.—The Italian equivalent for white.

Bigio.—This name, signifying grey, is given to several Italian marbles. Bigio del Fiume Grassino is quarried near Grassino, in Tuscany. It is grey, closely marked with white veins. Bigio di Radi is a grey marble quarried near Siena. Bigio Bianco, quarried at Trapani, in Sicily, is grey with white spots. Bigio con frappa di Pisa, found near Mugnione, is grey with olive-coloured spots.

Bird's Eye.—A marble bearing this name is quarried at Highlow, Derbyshire. It has a ground of mottled grey, and numerous fossil crinoids. See Derbyshire.

Bisachino.—A marble quarried at this locality, in Sicily, is of an uniform light apple-green. Some varieties of it are whitish, spotted with yellow.

Biscuit de Florence.—See Alabaster.

Bisé.—The marbles quarried at Bisé, in the Upper Garonne, France, comprise black Fleur-de-Pêcher, which see; Rouge

Sanguin, resembling Griotte, which see; and Turquin, presenting varied shades of grey and white.

Black.—The finest black marble in the United Kingdom is quarried at Ashford, Bakewell, and Derby, in Derbyshire. The Welton marble, from Staffordshire, is coarse. That found at Ribblesdale, Sedbury, and in the western moorlands of Yorkshire, is durable. A hard, durable marble, which takes a good polish, is quarried at Port St. Mary, Isle of Man. The British black marbles, although fine in colour, do not yield large blocks free from faults. The best quality occurs in thicknesses of from three to nineteen inches. In Ireland, black marble is found in the Galway quarries at Auglihan and Menlough, where blocks about 14 feet by 5 feet by 13 inches are obtained. Black marble is quarried at Kilkenny, which takes a beautiful polish; but after a time the blackness fades and small white fossil forms become visible upon the surface. A fine black marble is found at Crayleath, Co. Down. Black marble is also found at Churchtown and Doneraile, Co. Cork, at Carlow, in the neighbourhood of Tralee, and in the islands of Kenmare River. In Italy a black marble, sometimes called Paragone, is found mixed with marble of an inferior quality at Castle Nuovo, in Piedmont; at Como; at Barga; Vallareno; and Porto Venere, in Tuscany; at Guzzinaga, in Brescia; and at Santa Maria del Bosco, in Bergamo. In France, black marbles are quarried at Mont Majeur, in the Upper Garonne department, and at Bellignies, in the Nord department. Belgium black is quarried at Golzinnes, Dinant, and Augre, and is generally thought superior to that produced in France. Black marble is also found at Spa, in Germany. At La Mancha, in Spain, is found a fine deep black marble, which takes a good polish. Another is found near Segovia. See Fareau.

Black Vein.—This marble has a deep black ground, finely marked with white veins. It is sound and durable, takes a good polish, and can be obtained in large sizes. It is quarried near Yeumont, on the banks of the river Sambre, in France, close to the Belgian frontier.

Black and White Antique.—See Panno di Morto.

Blaigowrie.—A white statuary marble is quarried at Blaigowrie, in Scotland.

Blanc Fleuri.—See Bleu Fleuri.

Blanc P.—This marble, quarried at Carrara, in Italy, is of a slightly bluish white, obtainable in large blocks without spots or marks. In general tone it resembles Sicilian.

Bleiberg.—The marble quarried at Bleiberg, in Austria, has a grey ground, diversified with red, blue, and green tints, which are reflected with opalescent lustre, the effect being heightened by the presence of iron pyrites in the marble. It is extremely brittle, and is not much used on that account.

Bleu d'Arbois.—A marble exhibiting combinations of bluish grey and white is quarried at Valle-en-Pollières, near Arbois, in Jura, France.

Bleu Doré.—This marble, quarried at Chatillon, in Côte d'Or, France, has a bluish ground, with veins of yellowish gold.

Bleu Fleuri.—This name, or Blanc Fleuri, is given to a marble quarried at Popolasca, Corsica. It exhibits mingled shades of yellow, pink, red, green, and violet.

Bleu de Neuville.—See Neuville.

Bleu Turquin.—See Turchinechio.

Blue.—The blue marbles available for decorative purposes comprise Bleu Belge, Bardilla, and Turchinechio. A fine blue alabaster (gypsum) is found at Sulz, on the Neckar, in Germany.

Blue Antique.—This is a very scarce antique variegated marble. It has a ground of reddish white, with spots of slate-colour resembling festoons.

Blue John.—This is a Derby fluor spar, from Tre-Cliff, near Castleton. It is translucent, exhibiting a ground of clouded white and warm grey, tinged with iridescent amber-colour, with wave-like bands and lines of very dark purple, resembling the colour of writing-ink. It has only been obtained in small sizes, rarely exceeding six inches in depth. It is understood that the genuine Blue John is not now obtainable from the quarry.

Bône.—This marble, named after its quarry, near Edough, in Algiers, is greyish white, with occasional black veins.

Boue.—At Boue, near St. Beaume, is found a marble spotted with red, white, fawn-colour, and silver-grey.

Boulonnais.—This name is generally bestowed upon all marbles quarried in the neighbourhood of Marquise, Pas-de-Calais, France. See Napoleon and Stinkal.

Bounardelière.—This is a common white marble named after its quarry in Vienne, France. A marble called Le Rousset, yellowish, tinged with grey, and veined with white, is found in the same locality.

Bourbonnais.—This name is given to a bluish grey marble, veined with grey, which is quarried at Corbigny, in Nièvre, France.

Bouvignes.—The marbles quarried at this locality, in Belgium, have a black ground with patches of dark grey, and sometimes with white spots and veins.

Brayelle.—See St. Anne.

Breccia.—This term is applied to brecciated marbles, or those which contain fragments of some older rock, held together by an intermediate material. The fragments are understood to be larger than the grains occurring in the stones called oolites, and smaller than the masses forming those called conglomerates. Little Breccias are those in which the fragments forming them are less than an inch in diameter, and Great Breccias, those in which they are more. Some encrinital marbles are called brecciated. See Encrinital.

Breccia Antica.—This shows spots of red, black, white, grey, and dull blue, in rounded forms and unequal sizes. It is quarried at Aubert, in Ariège, France, and is called *Brèche Antique*.

Breccia Antica Grande.—This marble is a brecciated variety of Grand Antique, which see. It has large black spots with a few fossil shells, and is crossed by zig-zag white lines. It is quarried at Aubert, in Ariège, France.

Breccia Antica Piccola.—This is a brecciated variety of Grand Antique. It resembles Breccia Antica Grande, but the spots in it are smaller, and instead of being black they are dark grey. It is quarried at Aubert, in Ariège, France.

Breccia Dorata.—See Giallo Antico.

Breccia Pavonazza.—This is an antique marble having a white ground and red spots.

Breccia di Porta Santa.—This is a scarce antique marble with unequal white, blue, grey, and red spots.

Breccia di Serravezza.—This marble is quarried at Strazzezza, near Serravezza, Italy. It has a white ground tinged with purple, with spots of red, and sometimes, but rarely, of black. Some varieties are red, rose-colour, lilac, peach-colour, or yellow. See Serravezza.

Breccia di Verde.—This beautiful marble is composed of angular and rounded fragments of marble, greenstone, slate, gneiss, porphyry, and serpentine, united with a compact paste, varying from all shades of green to a dark purplish-red.

Breccia di Verona.—This fine marble, obtainable in large sizes, is quarried in the upper mountains of Vallarsa, Italy. It presents a crystalline mass of pale red, mixed with yellow, black, and sky-blue.

Brecciato Tracagnina.—This is an antique breccia, almost a puddingstone. It has a ground of pale yellow with spots of white, grey, brown, green, and red.

Brèche Africaine.—See Breccia Serravezza.

Brèche Antique.—See Breccia Antica.

Brèche Caroline.—See Beaudean Breccia and Sarancolin.

Brèche Chinoise.—This name, or Chinese Breccia, is given to a marble of a deep blackish grey, quarried at Cierp, in the Upper Garonne, France.

Brèche d'Aix.—This marble, quarried at Aix, in Provence, has a yellowish ground with small grey, brown, and red spots. It takes a high polish.

Brèche d'Alep.—See Aleppo Breccia.

Brèche d'Alet.—See Alet Breccia.

Brèche de l'Ariège.—This is the same as Petit Deuil. See Deuil.

Brèche de Dourlais.—This marble, quarried at Vaulsort, Belgium, has a ground of pinkish white, with irregular angular spots of light yellowish brown, red, black, and grey and white veins.

Brèche d'Italie.—See Italian Breccia.

Brèche de Memphis.—This marble has a reddish ground, and small white, grey, and brown fragments. It is quarried at the mountain of Sainte Victoire, in Bouches-du-Rhone, France. Other varieties are Sainte-Victoire Grand Melange, a breccia exhibiting nearly every colour in small patches and spots, and Sainte-Victoire Rouge, having a ground deeper red than Brèche de Memphis.

Brèche de Portugal.—The same as Baixas, which see.

Brèche des Pyrenees.—The brecciated marbles quarried near Signa, in the Upper Pyrenees, France, exhibit several varieties. Some are reddish brown with black, grey, and red spots; others are of a clear orange yellow with white spots; and others again are yellow with small black spots closely placed.

Brèche de Tarentaise.—This marble has a violet ground and small spots of white, blackish grey, and yellow. It is quarried at Villette, on the right bank of the Isère, France, and is called Brèche Violette d'Hermitage.

Brèche Galifet.—This is a brecciated marble, having fragments of red, grey, and black, quarried at Tholonet, in Bouches-du-Rhône, France. It is much esteemed, and takes a high polish. The marble called Beaurecueil is a species of brocatello

with similar colours, but more yellowish and more speckled. It is quarried at Beaurecueil, near the same locality.

Brèche Imperiale.—This marble, quarried at Montigny-Saint-Christophe, in Hainaut, Belgium, has a ground of very dark grey, almost black, sprinkled with fossil shells of a lighter grey.

Brèche St. Antonin.—This name is sometimes applied to varieties of Alet Breccia in which red predominates. See Alet Breccia.

Brèche Vierge Antique.—This very scarce antique marble has a ground of chocolate brown, numerous angular white spots, and a few red spots.

Brèche Violet.—See Italian Breccia.

Brèche Violette d'Hermitage.—See Brèche Tarentaise.

Brema.—The marble quarried at Brema, in Italy, is yellow with white spots.

Brentonico.—At Brentonico, in the neighbourhood of Verona, is a breccia with large spots of pink, yellow, and iron grey.

Brescia.—A pale red marble with white veins is found at this locality in the old province of Brescia, Italy.

Bressano.—A marble quarried at this locality, in Italy, is dark green, mixed with serpentine, with yellow spots and silvery white fragments of talc.

Brest.—This marble, named after the neighbourhood of its quarry in Finistère, is of a deep black with veins of light grey. A red lumachello, having white fossil rings, is found in the same locality.

Bridgend.—Some marbles quarried at Bridgend, Glamorgan-shire, have a varied ground of dark greenish grey, with marks and spots of pinkish white.

Brignolles.—The marble quarried in this neighbourhood, in Vau, France, is white tinged with red.

Bristol.—Various marbles are quarried at Clifton, and in the neighbourhood of Bristol, exhibiting mostly different shades of light, brownish red. Some specimens have a ground of blackish green, with whitish fossil spots and rings. See Landscape and St. Vincent.

Brocatello.—This term is applied with different meanings in France, Italy, and Spain. French brocatello has a bluish grey ground, with brown and rich yellow veins, and contains minute fossils. It is quarried in the neighbourhood of Moulins, in the department of Allier, and is called Brocatelle de Moulins. Dark yellow, clear yellow, violet, and pink varieties of broca-

tello are quarried at Moline, in the department of Jura. Italian brocatello, called by the French, Brocatelle de Sienne, has a rather dark rich yellow ground, broken into large irregular spots by veins which vary in colour from bluish black to purple and dark red. Spanish brocatello, known as Tortosa Brocatello, or the French Brocatelle d'Espagne, has a dark red ground, covered with minute yellowish grey and clear white spots, with some violet spots and veins. It is quarried near Tortosa, in Catalonia, Spain. See Lumachello.

Brulat (Le).—A marble quarried at this locality, near Gourdon, in Lot, France, is a lumachello, resembling Petit Deuil in appearance. See Deuil. A lumachello of a light reddish brown is quarried in the same locality, and a similar marble is found in the valley of the Bléou.

Buckfastleigh.—See Devonshire.

Buixater.—See Statuary.

Caen.—In the neighbourhood of Caen, France, is quarried a marble of pinkish red colour with large grey and white veins, called Caen marble. A black marble is quarried in the same locality, and is often substituted for the black marble of Dinant, to which it is inferior.

Cahors.—A fine red griotte, veined with white and bluish grey, is found at Cahors in Lot, France. A fine yellowish brown stone resembling marble is found at Crayssac, in the neighbourhood.

Cahus.—A marble quarried at this locality in Lot, France, exhibits combinations of white, green, and black.

Cajarc.—In the Commune de Cajarc, in Lot, France, several grey brecciated marbles are quarried.

Caldana.—This marble, quarried at Marmière, in Tuscany, has a dark violet ground, with white spots caused by fossils.

Cambovin.—This name is given to a fine white stone resembling marble, quarried at Cambovin, in Drôme, France.

Camonica.—This is a grey marble mottled with black and white. It is quarried in the valley of Camonica, in Brescia, Italy.

Campan.—The Campan marbles, so called from the situation of the quarries in the Upper Pyrenees, are exceedingly beautiful, and present great varieties of colour. Campan Isabelle has a delicate rose-coloured ground, which in some places merges into a dark red, with a few white spots and pale green veins. Campan Rouge has a dull, blood-red ground, with veins of darker red and bronze green, and spots of fleshy, and

sometimes greenish white. Campan Vert is of two kinds, the clear and the dark. The former has very light shades of green softly blended as a ground with thin veins of darker green, forming a network with long meshes. The dark Campan Vert has a ground of dark green with numerous flesh-coloured spots. Sometimes there are also spots of transparent green, or small red spots and thin white veins. The mixed Campan combines all these varieties, which are found in layers, each occupying a space of from a few inches to three or four feet in depth. See Isabelle Campan.

Canarino.—See Giallo Antico.

Canelle.—This name, signifying cinnamon, is given to a dark reddish brown marble quarried at Taveau in Nièvre, France.

Cardiglio.—See Cipollino.

Carew-Norton.—See Pembrokeshire.

Cargoloin.—This marble, named after its quarry near Nuits, in Côte d'Or, France, is yellow, with purple veins.

Carniolo.—This marble, named after the province where it is quarried, in Austria, is flesh-red in colour, veined and shaded with white. In the same province are quarries of brecciated marbles having a matrix of pale red, and fragments of grey, white, and blue.

Carol.—See Statuary.

Caroline Breccia.—See Beaudean Breccia, and Sarancolin.

Cartrare.—This marble, named after its quarry in Côtes-du-Nord, France, has a ground of blackish grey, veined with greyish white.

Caserta.—This marble, named after its Italian quarry, has a ground of pale fawn-colour, with crimson patches, and interlacing white veins.

Castel-Franco.—A marble quarried at this locality in Tuscany is olive green, with bands of black and is called Verde di Castel-Franco.

Castera-Verduzan.—A marble thus named after its quarry in Gers, France, is of a fine yellow tint, almost uniform.

Castres.—Noir de Castres is a deep black marble of medium quality, quarried at Castres, in Tarn, France. Some granites and puddingstone marbles are also found here.

Cé.—The marble known by this name is quarried in the valley of Seriana, Italy. It is leaden grey, marked with white.

Céon.—On the right side of the valley of the Céon, in Lot, France, is quarried a marble having a clear brownish yellow

ground, clouded with black. It takes a good polish. A brecciated variety is also found here.

Cerfontaine.—The marbles called Cerfontaine and Charleville, after the names of their quarries in Ardennes, exhibit combinations of red, grey, blue, and white, with fossil shells.

Cervelas.—This marble, called also Cervelatte, or sausage marble, has a dark red ground with grey veins and white spots. As an antique marble, it is said to have been found in the north of Africa. A variety called Cervelas Rosé Vif is now quarried at Cannes, in the département of Aude, France. A cervelas having a dark red ground, with whitish and grey veins and spots, is found in Ariège, and a somewhat similar marble is found in Indre. See Villefranche.

Cette.—A marble thus named, and quarried near the port of Cette, in Hérault, France, is dark red marked with grey and white.

Chalanches.—This marble, named after its quarry in Isère, France, has a ground of pinkish white, with spots or grains resembling sugar.

Chalons.—A marble quarried here, in the département of Saône-et-Loire, France, is red, with white fossil shells.

Champoli.—This marble, named after its quarry in Loire, France, shows combinations of blue, grey, white, and yellow.

Champ-Robert.—This marble, named after its quarry in Nièvre, France, is greyish white, with small black veins. It is sometimes used for statuary. See Nivernais.

Charence.—See Gap.

Charlemont.—The marble quarried at Charlemont, in Ardennes, resembles Givet, which see. Other varieties quarried here are mostly black and white.

Charleville.—See Cerfontaine.

Chartreux.—This is a fine white marble quarried at Cambovin in Drôme, France.

Chateau.—The marble quarried at the Montagne du Chateau, in the Eastern Pyrenees, France, is a breccia, with a ground of ashy grey, veined with blue.

Château-Landon.—This species of marble, named after its quarry in Seine-et-Marne, France, exhibits varied shades of yellow in bands or layers, with whitish translucent veins and fossil shells.

Chatelperron.—The marbles quarried at and near this locality, in Allier, France, are chiefly of a greyish white. Some have pinkish veins, and others, as those found at Gilly, are

veined with yellow. Some white marbles are found, and some exhibiting combinations of blue, white, and grey.

Chaumont.—A marble quarried at Chaumont, in the Upper Marne, France, is of a whitish grey, with pink spots. It takes a high polish.

Chenove.—A marble quarried at this locality, in Côte d'Or, France, has a ground of light brown with small white spots.

Cher.—The marble called by this name exhibits combinations of red and grey. It is quarried at Salle-au-Roi, in Cher, France. See St. Pallaye.

Chippal.—This marble, named after its quarry in the Vosges, France, is white and crystalline. Some varieties of it are of a greyish white with blue veins.

Chorges.—See Portor.

Churchtown.—This marble, named after its quarry in County Cork, Ireland, is red speckled with white, of a fine appearance. Some brownish red and black marbles are also found here.

Cintra.—The “blue” marble quarried at Cintra, near Lisbon, has a grey ground spotted and veined with blue and black. It is highly crystalline, and takes a good polish.

Cipollino.—This name is given to marbles having a whitish ground traversed with veins of green talc. To this class belongs Cipolinnacci di Carrara, quarried at Carrara. A kind found at Pentelicus, in Greece, is called Statuary Cipollino. A marble called Cipollinaccio has a white ground with greenish grey spots and bands. It is obtained from the valley of St. Maurice, in the Upper Alps; from La Tuile, Mont Blanc; and from several parts of Savoy and Piedmont. A grey variety of Cipollino, called Cardiglio, is obtained from Sicily. Cipollazzo is white streaked with violet. Cipolaccia has a bright yellowish green ground, with large and small square black spots, and sometimes with smaller white ones intermingled. A fine Cipollino is quarried at Onofrio, in Corsica. Some varieties are found at Basle, in Switzerland.

Claret.—This marble, named after its quarry in the Lower Alps, has a ground of white and grey speckled with black.

Clifton.—See Bristol.

Cluny.—A white marble is quarried at this locality in the department of Saône-et-Loire, France.

Cluse (La).—See Malpas.

Coarlou.—This marble, named after its quarry in Côte d'Or, France, is of ashy grey colour, marked with fawn colour.

Coltshill.—See Swansea.

Como.—A pure black marble, is quarried at Como.

Connemara.—This is a serpentine called Irish Green. See Serpentine.

Coraline Breccia.—The same as Sarrancolin, which see.

Corbigny.—See Bourbonnais.

Cork.—Some marbles quarried in Cork, Ireland, show a ground of fleshy red and pink, with dark thin veins and white specks. See Churchtown and Victoria Red.

Cornac.—At this locality, and at Trespoux, in Lot, France, marbles are quarried having a red ground with veins of white and greenish grey. A marble called Universel, exhibiting combinations of red, grey, white, yellow, green, and black, is also found at Trespoux.

Corsican.—The Corsican marbles, quarried at Onofrio, comprise white statuary of singular purity, bardilla, and cipollino.

Cosne.—At Cosne, in the Nièvre, France, is quarried a marble somewhat resembling Griotte, which see.

Cotonello.—See Languedoc.

Cousance (Le).—A marble quarried at Cousance, in Jura, France, has a ground of variegated grey, with round reddish spots, and a network of radiating marks.

Crestola.—See Statuary.

Croset (Le).—A marble named thus, and quarried at Les Crosets, in Jura, France, is of an olive bronze tint, with undulating lines and spots of pale red.

Dauphin.—This marble, quarried near Baune, in Côte d'Or, France, is of a pale red, melting into white, and sometimes into agatised violet. It takes a good polish.

Derbyshire.—The marbles of Derbyshire vary in colour between black, blue, light grey, and russet. They are chiefly encrinital, their varieties of pattern depending upon the character and arrangement of the fossils embedded in them. These marbles comprise the Bird's-eye, the Dog's-tooth or Mussel, the Entrochal, Shelly, and the brecciated varieties. For black and Rosewood see Ashford. See Blue John and Wetton.

Désert (Le).—At Le Désert, in Isère, France, marbles are quarried comprising a white statuary, some varieties of which exhibit white, pink, and green, with some green veins; and a Poudingue Vert, or green puddingstone, which contains rounded patches of white, grey, green, yellow, and black.

Deuil.—This term, which signifies mourning, is applied to marbles quarried at Moulis and its neighbourhood, in Ariège,

France. Grand Deuil has a white ground with black streaks. Petit Deuil is similar but with smaller streaks. Similar marbles are quarried near Valmiger, in Aude, France.

Devonshire.—The Devonshire, or Devonian marbles, present considerable variety, and are mostly quarried in the neighbourhood of Plymouth, Petit Tor, Babbacombe, and Newton Bushell. Some of them are madreporic, containing minute fossil shells, and the prevalent colours are different shades of grey with white and yellow veins. A marble exhibiting mottled pink and grey, with marks and patches of blood-red, is quarried at Buckfastleigh. Red varieties occur in smaller quantities. A handsome reddish marble is quarried at Ipplepen, near Totnes, and one of similar beauty at Babbacombe. See Babbacombe. A green marble and a rose-coloured spar of great beauty are quarried at Kitley Park. Varieties of black and white marble are quarried at Bridestow, South Tawton, and Drewsteigton. Marbles having a black ground and large veins of semi-transparent white are found at Chudleigh, Staverton, and Berry Pomeroy. See Ashburton, Happaway, Ogwell, and Petit Tor.

Diaspro della Rochetta.—This marble, quarried at Rochetta, in the territory of Siena, exhibits a mixture of a great variety of colours.

Digne.—A marble quarried near this locality in the Lower Alps, and called Brèche Jaune de Digne, resembles Brèche d'Alet, which see. It has a ground of bluish tint, with spots of yellow, red, brown, and grey.

Dog's Tooth.—See Derbyshire.

Dole.—The marble quarried in this neighbourhood, in Jura, France, is of a fine purple red, and of a fine grain. It can be obtained in large sizes.

Dornington.—Some marbles quarried at Dornington, Herefordshire, have a ground of varied greenish grey, with dirty white and yellowish spots.

Doué.—A marble quarried at this locality, in Cote d'Or, France, exhibits varied shades of purple and small white spots.

Doulers.—A marble quarried at this locality, in the Nord department, France, is a breccia with white, grey, and reddish spots.

Dove.—This term is applied to various marbles presenting a bluish grey or dove-coloured hue. The best known specimens are quarried at Canal Grande and Collonata, Italy. These marbles are very hard.

Drap Mortuaire.—This name is given to marbles having a

black ground with occasional white fossil shell-fish, called gasteropoda. The quarries are in the neighbourhood of Angre, Belgium, where pure black marble is also found.

Draycot.—A marble found at Draycot, near Wells, has a ground of brownish red, with large and small spots of grey and various hues of brown.

Dunkerron.—In the islands of the Kenmare River, near Dunkerron, Ireland, marbles are quarried exhibiting combinations of black and white; white, yellow, and purple; and purple veined with dark green.

Ecton.—The marbles quarried at Ecton, Staffordshire, have, in some cases, a ground of brownish grey and a network of white veins. Other varieties are of a pale, warm brown, with brown shell-spots.

Eglie du Roi.—This marble, quarried at St. Maurice, near Gap, in the Upper Alps, exhibits combinations of white, pink, red, and yellow.

Egyptian Green.—This marble has a darkish green ground with spots of grey and occasionally of white. Another variety has a red ground with clear dark green veins and a network of white lines. Both marbles are quarried in the neighbourhood of Carrara. Egyptian Green should not be confounded with Verde Antico, which see.

Elban.—The marbles from the Island of Elba are mostly white with blackish green veins.

El Buix.—See Statuary.

El Gitanos.—See Statuary.

Elinguehen.—Marbles exhibiting combinations of red, grey, and white are quarried at this locality, in Pas-de-Calais, France.

El Slop.—See Statuary.

Elmentier.—This marble, named after its quarry, in Correze, France, exhibits several semi-transparent tints mingled with silver upon a red ground.

Emperor's Red.—This marble, quarried in the neighbourhood of Lisbon, is of a mottled yellowish pink, some large patches of light red occurring occasionally, with veinings of dark red and brown.

Encrinital.—Marbles called encrinital or entrochal, are those which contain fossil encrinites, crinoids, or stone-lilies. These, with their stems and arms, are sometimes called "wheel-stones," and when cut in various directions they impart a peculiar star-like pattern to the marble. A marble crowded with

fragments of minute encrinites is called "bird's-eye," and is quarried in Derbyshire. See Derbyshire. An encrinital marble is quarried at Poolwash, in the Isle of Man. See Poolwash. On the Continent a dark grey marble with small sections of crinoid stems goes by the name of "Petit Granit." See Petit Granit.

Entrevaux.—This marble, named after its quarry, in Var, France, is grey, veined with white.

Entrochal.—See Encrinital.

Estendar.—Several varieties of marble are quarried at this locality, near St. Maximin, in Var, France. Some have a grey ground with black spots and brilliant yellow veins. A kind called *Isabella du Var*, is light brownish yellow tinged with red. A *griotte*, resembling *Griotte d'Italie*, is found here. Some *brocatello* marbles, exhibiting shades of yellow, grey, blue, violet, red, and white, are also found. There are also granites, a red porphyry, and a serpentine.

Estival.—A serpentine is quarried at this locality, in Lot, France. It is of a deep green, with clear green crystals embedded in it.

Estremoy.—A coarse crystalline white marble, is quarried at this locality, in Portugal.

Etroeugt.—This marble, called *Brèche d'Etroeugt*, after its quarry in the Nord department, France, shows greenish and grey spots speckled with red.

Falcovaia.—See Statuary.

Fareau.—This marble, quarried at La Fare, in the neighbourhood of Gap, in the Upper Alps, is of a fine deep black, and takes a good polish.

Fauche.—A grey marble with white veins is quarried near this mountain, in the Eastern Pyrenees, France.

Fausse Griotte.—This name, or False Griotte, is given to a fine-grained marble, quarried in the neighbourhood of Dôle in Jura, France. It is veined, combining pale and bright red, and spotted with white. It takes a good polish.

Faux Cervelas.—This name, or False Cervelas, is given to a marble showing combinations of yellow, red, grey, and blue, in configuration resembling *Cervelas*, which see. It is quarried at Taveau, in Nièvre, France.

Faux Portor.—This name, or False Portor, is given to a marble quarried at Marche-les-Dames, in Namur, Belgium. It has a yellow ground with deep grey spots and yellow veins. It does not in the least resemble the real Portor marbles.

Féronville.—A yellowish grey marble, which takes a good polish, is quarried at Féronville, Meuse, France.

Fior di Persica.—This term, signifying peach-blossom, or fleur de pêcher in French, is applied to an antique breccia having a white ground with large violet spots closely placed, and inclining sometimes to wine-colour. It bears a modified resemblance to Aleppo Breccia, and must not be confounded with the French Fleur de Pêcher. See Aleppo Breccia and Fleur de Pêcher.

Fiorito.—See Languedoc.

Fire Marble.—See Lumachello.

Firenze.—A clear green marble is quarried at this locality in Tuscany.

Fixin.—This marble, named after its quarry in Côte d'Or, France, has a red ground veined with white.

Fleur de Pêcher.—This term, signifying peach-blossom, is applied to a greyish white marble with red veins, quarried at Savennières, in Maine-et-Loire, France. It must not be confounded with the Italian Fleur de Pêcher. (See Fior di Persica.) A marble called Fleur de Pêcher, exhibiting shades of peach-colour, white, pink, and brown, is quarried at Bisé, Upper Garonne. See Bisé.

Floriac.—This marble, named after its quarry in Lot, France, is yellow, with patches of grey and red.

Florence.—This name is given to some Belgian marbles found in Namur. Varieties quarried at Lesves have a ground of pale ash grey, with irregular grey spots evenly distributed, with small yellowish white veins, which do not extend over the spots. A similar marble is quarried at Philippeville, but darker in colour and without veins. Another found here has a ground of reddish grey with spots of dark grey and black. Another, found at Thon, has a more reddish ground blended with black with a few white spots. Another, found at Samson, is similar, but the ground is paler, blended with reddish grey, and with black bands, more or less parallel. Some of these marbles resemble Léopard, which see.

Florimont.—The marbles quarried at this locality, in Dordogne, France, are mostly white mingled with yellow, with grey and black veins.

Flumay.—See Statuary.

Fontaine-l'Évêque.—The marbles quarried here include, besides Frédéric, which see, a breccia having a reddish ground slightly varied with very small grey spots and white veins.

Fontenelle.—The marbles quarried at Fontenelle, Aisne, France, have a ground of bluish grey and white cloudy veins. Lumachelle des Bossus has a similar appearance, but contains whitish translucent fossils. A blue lumachello is similar, but with blackish fossils.

Fosse.—The marbles quarried at this locality, in Belgium, have a grey ground with numerous white conical fossils.

Fougères.—A marble thus named after its quarry in Hérault, France, shows combinations of yellow and violet.

Framayes.—A black marble is quarried at this locality, near Macon, in the department of Saône-et-Loire, France.

Framont.—This marble, named after its quarry in Vosges, France, is white, sometimes tinged with pink or pearl grey. Some specimens are red.

Frédéric.—The marbles called by this name are quarried in Hainaut, Belgium. Some varieties found at Landelies have a reddish ground with yellowish white veins here and there, running nearly straight and intersecting at all sorts of angles. Varieties found at Fontaine-l'Évêque have a black ground with reddish grey marks arranged in nest-like forms, and small grey and white veins running in all directions. Some specimens found here have a similar ground, but with small white veins running nearly straight and intersecting in all directions.

Frome.—The marbles quarried at Frome, Somersetshire, are chiefly dark brown, brownish red, and warm brownish grey, with streaks and veins of yellow and grey. Some varieties exhibit dark brown spots upon a grey ground. Others have a ground of very dark grey, almost black, with grey veins and spots, caused by small fossil shells.

Gabro.—See Serpentine.

Gaconnière.—This marble, quarried in Deux-Sevres, France, is black with blackish grey veins. A cervelas, showing white, red, grey, violet, and yellow, is found in the same neighbourhood.

Gandrieux.—This marble, named after its quarry in the Nord department, France, is grey and black with white veins. (See Pacagne.) Another marble found here shows combinations of red, brown, grey, and black, and is called Rouge de Fontaine.

Gap.—At Le Clarence and Le Morgon, near Gap, in the Upper Alps, marbles are quarried having a ground of greyish brown lightly spotted with grey. Some varieties are greyish black, and all are easily worked. (See St. Firmin and St. Maurice).

Gassino.—A marble quarried at Gassino, in the neighbourhood of Turin, has a clear grey ground spotted with fossil shells.

Gherardesca.—A marble quarried at this locality, near Florence, is a brocatello spotted with white, violet, and flesh-colour. (See Pieva.)

Giallo Antico.—This is a yellow marble, called by the French, *Jaune Antique*. It is of the colour of the yolk of an egg, sometimes uniform and sometimes marked with black or brownish yellow rings. Some varieties of Siena resemble it. *Giallo breccia* is a brecciated variety of the same, having a light yellow ground with deeper spots. Another variety, called *Breccia Dorata*, has a red ground with yellow spots and small intermediate white spots. The ancient Roman quarries, which have been discovered within recent years, are at Chemtou, in Tunisia. The *Giallo Antico* found there is of excellent quality, comprising rose-tinted varieties, and is imported in blocks of as much as 8 feet by 4 feet. This marble is also quarried at the *Montagne Grise*, Kleber, Algiers. Varieties of it are known as *Paonazzo*, *Canarino*, and *Avorio*. *Paonazzo*, somewhat resembling in pattern the plumage of a peacock, is reddish, and has been compared to *Rosso Antico*. Some of these varieties have been called *Numidian*.

Givet.—The marble quarried at this locality, in Ardennes, and called *Rouge de Givet*, has a ground of deep red mingled with patches of white, and contains fossil shells. A marble called *Charlemont*, and quarried in the neighbourhood, is of the same colour but has white veins. Some black and white marbles are found at Givet.

Glageon.—This is a blackish *lumachello*, resembling *Petit Granite*, which see, and considered superior to it. It is quarried at Glageon, in the Nord department, France.

Gold.—The gold available in marble decoration is gold mosaic, as described in the chapter on mosaic work.

Gramat.—This marble, named after its quarry in Lot, France, is yellow, with ramified markings resembling trees.

Grand Antique.—This marble shows a ground of black and dark grey streaked with lines of white, sometimes zig-zag and sometimes nearly parallel. It is quarried at Aubert, in Ariège, France, and is obtainable in large sizes. See *Nero Antico*.

Grand Courtil.—See *Violon*.

Grande Chartreuse.—This marble, named after its quarry

in Isère, France, exhibits large patches of white, grey, pink, brown, and black.

Grand Jaspé.—This marble, quarried in the valley of Biros, in Ariège, France, shows combinations of grey, yellow, brown, green, and white.

Grand Noir.—This is a fine black marble, found at Pouilly, in Doubs, France. Some specimens of it are marked with white and grey.

Grand Rouge.—A variety of marbles bearing this name are quarried at Montferrier and Belasta, in Ariège, France. They present mixtures of white, grey, and red, and are very effective.

Granite.—This is a crystalline granular rock, not properly termed a marble, but, like porphyry, it is extremely durable and takes a high polish. Its chief colours are mottled grey, red, brownish yellow, and green in varied shades. Some of the grey varieties incline to blue. The red and grey granites of Aberdeen and Peterhead are among the most familiar. The Cornwall granites are chiefly dark grey with large white patches. Some varieties are nearly black, while others are red—called Oriental—and yellowish. For a Cornish granite of great beauty see Luxullianite. Syenite combines various colours, including reddish brown, grey, and yellowish brown in large patches. Its original source was Syene, in Upper Egypt, but it is now quarried in Pembrokeshire, Cumberland, and at Markfield Knowle, in Leicestershire. Some of the finest Continental granites are produced in Italy. Granito di Arno, quarried near the banks of the Arno, in Tuscany, is olive green speckled with brown and white. A deep red granite with black and white spots is found near the river Grassino. Minerale della Grassina is grey spotted with white. Two varieties of granite are quarried in the neighbourhood of Lake Maggiore. One, called Migliarolo Rosso, is mottled with red, grey, black, and white; the other, called Migliarolo Bianco, has a white ground with black and grey spots. Pale green granites with black and white spots are found in the Isle of Sardinia. Granites are found in nearly every department of France. At Giranze, in the Upper Alps, is found a pink and greenish grey spotted with grey and black; and a red granite with dark grey and white spots is quarried in the same neighbourhood, and called Le Severaise. Some grey granites are found at Ussel, in Corrèze. Granite de St. Brieuc is named after its quarry in Côtes du Nord. It is grey, of a fine grain, and takes a good polish. Some grey, pink, white, and

blackish granites are quarried at Florimont, in Dordogne. Some fine granites in varieties of colours are quarried near the mouth of the Isère, in Drôme. Granites of various colours, including red and bluish grey, are found at St. Julien, in the Loire department. They are said to be equal to those of Egypt. Granite de Cherbourg is quarried at Flamanville, in Manche. It is mottled with varied shades of grey, with black, and yellowish brown. Granite de St. Honorine, named after its quarry in Orne, is mottled with bluish grey and black. Granite de Tournavilles is similar, and quarried in the same department. Both are much esteemed in Paris. A fine grey granite, called Granite d'Arbresles, after the neighbourhood of its quarry in the Rhône department, is also much esteemed. At Lucs, in Vendée, is found a granite mottled with bluish grey and red. Some porphyries have been called granites. See Granite Vert des Vosges. For Belgian granite see Petit Granite.

Granitello.—This is a fine-grained grey granite, quarried near Raide-de-Brest, in Finistère, France, and sometimes called Kersanton.

Granite Vert des Vosges.—This name is given to a kind of green porphyry containing crystals so closely packed that they almost hide the ground colour. It is found at Chaume, in the department of Vosges, France. See Porphyry.

Green.—The green materials chiefly available in marble decoration comprise varieties of dark green porphyry, found in large sizes, and sufficiently durable for external use; the dark green serpentines only suitable for interiors; and all those marbles having the prefix *vert* in French, or *verde* in Italian, which are described under their respective names. For light greens we have Vert de Gêries and Campan Vert.

Griotte.—This name is generally given to those marbles showing oval blood-red spots upon a dark brown ground. That which is called Italian Griotte, or Griotte d'Italie, is quarried at Cannes, in the neighbourhood of Carcassone, in the department of Aude, France. It has a ground of pinkish red, clouded with darker red and brown, with thin veins of semi-transparent bluish white. There are three varieties, the florid (*fleuri*), the feathered (*panachée*), and the partridge-eye (*œil de perdrix*). The latter has numerous small spots or eyes of pure pearly white, which give a strikingly beautiful appearance to the marble. There is a griotte quarried at Félines d'Hautpoul, in Aude. Griotte des Pyrénées and Griotte de Sost are quarried in the communes of Esbareich and of Sost, in the Upper Pyrenees. A griotte

quarried at Campan has a fine blood-red colour, and indeed the griottes generally furnish some of the finest reds available in marble decoration. A fine griotte is quarried in the neighbourhood of Cahors, in Lot, France. See *Rosso Antico*.

Gris Panaché.—This name, or streaky grey, is given to a black marble veined with grey, found at Le Psychaguay, in Isère, France.

Guillaume.—This marble, quarried at Landelles, in Hainaut, Belgium, has a ground of pale whitish brown with darker shades of the same tint here and there. A similar but darker variety is found at Chénu, near Dinant.

Guillestre.—This puddingstone marble, named after its quarry, near Embrun, in the Upper Alps, has a red ground with rounded spots of white, grey, and yellow. For another Guillestre see *St. Maximin*.

Guipuzcoa.—At the mountains named thus in Spain is quarried a red marble veined with grey, and closely resembling *Sarancolin*, which see.

Happaway.—A Devonshire marble called *Dove Happaway*, has a ground of light, warm grey, with paler blotches, and veins of slightly darker grey here and there. See *Devonshire*.

Harpenden Puddingstone.—This marble, quarried at Harpenden, Hertfordshire, has large orbicular spots, mostly orange, with red in the middle and brown at the edges, set closely in a ground of grey and yellow.

Héchette.—At Héchette, in the Upper Pyrenees, is found a black marble veined with white and grey.

Hécourt.—A grey *lumachello*, with black fossils, is quarried at this locality, in Oise, France.

Heer.—A marble quarried at this locality, in Namur, Belgium, has a reddish ground blended with pale grey, with occasional yellowish white veins.

Herbosum.—This is a fine antique marble, with varying shades of grass green.

Hopton Wood.—This stone deserves to rank as a marble, for it will take an excellent polish. Its colour is a pale brownish white, and it is quarried in the neighbourhood of Middleton and Wirksworth, Derbyshire.

Houdain.—The marbles quarried at this locality, in the Nord department, France, are black, with white and yellowish spots.

Huronian Conglomerate.—This material, which takes a fairly good polish, is quarried upon the shores of Lake Superior, Canada. It shows a ground of light mottled grey in large

rounded patches, with large spots of slate blue, brown, and bright red both dark and light.

Hymettian Marble.—This is an antique marble from Mount Hymettus, near Athens. It has a ground of dingy white, with a slight tinge of green, and long parallel dark grey veins of varying breadth.

Iberian Agate.—This marble shows a mixture of dark red, yellow, and slate colour, and various combinations of these tints. It is quarried near the town of Villa Nova d'Ourem, Portugal. It is of a hard, compact texture, and takes a good polish.

Iona.—The marble quarried at Iona, in the Hebrides, is grey and white, sometimes with yellowish spots or veins of yellowish white. It does not take a high polish.

Irish Green.—The same as Connemara Serpentine. See Serpentine.

Isabelle.—This is the French name for a colour somewhat between white, yellow, and flesh colour. A marble of this colour, called Isabelle marble, is quarried at Cierp, in the Upper Garonne, France, and another at Montrouge, Seine.

Isabelle Campan.—This marble must not be confounded with Campan Isabelle. It is quarried between Cannes and Villartel, in Aude, France. It has a ground of strong bright red, with translucent spots of orange red and some white spots. It takes a high polish.

Isabelle du Var.—See Estendar.

Istrian Marble.—This is quarried in Istria, near Trieste, in Austria. It is of a light cream colour, and is very compact and durable.

Italian Breccia.—This marble, called by the French, Brèche d'Italie, is found in various parts of Italy. It has a reddish brown ground and white veins. It is sometimes called Brèche Violet.

Izernore.—A marble thus named after its quarry in Ain, France, exhibits shades of bluish ash grey, and is translucent.

Jaune Fleuri.—See Lamartine.

Jaune de la Nièvre.—This is a yellow marble with brownish marks, quarried at Clamecy, Nièvre, France.

Jaune Uni des Pyrenées.—This marble, quarried at Hers, in the Upper Garonne, France, is of a fine yellow colour, almost uniform.

Joinville.—See Lunel.

Joligny.—This marble, named after its quarry near Moulins, in Allier, France, has a bluish ground speckled with red, black, and grey.

Kersanton.—See Granitello.

Killarney.—A beautiful marble striped with red and white is quarried at Killarney, Ireland.

Kitley Park.—See Devonshire.

Kurnool.—This name has been given to a limestone quarried at Beejapore, India. It is fine and close, and takes a good polish. Its colour is yellowish or creamy grey.

Labradorite.—This is a very beautiful kind of spar, found in small sizes at Labrador. It exhibits various tones of bright blue and green, sometimes translucent, in veins and patches, with opaque green and grey, and streaks of greenish gold.

Laconian Marble.—This is a green porphyry, the ancient quarries of which have been discovered near Levetza, between Sparta and Marathon. See Porphyry.

Lamartine.—The marble called Jaune Lamartine is of a fine yellow tint, with small veins of brownish red and grey. It is quarried at Vaux, in Jura, France. Jaune Fleuri is another variety of the same, quarried at Pratz, in Jura. It is of similar appearance, but of a much darker yellow, some specimens being of a rich reddish brown, and the veins in it are more closely distributed than in Jaune Lamartine.

Landscape.—This term is applied to marbles which exhibit patterns resembling landscape prospects, caused by fossil vegetable growths. A landscape marble, quarried at Penarth, near Bristol, has a ground of pale greyish brown, with dendritic or tree-like markings of varied brown and dull sap green.

Landscape (Florence).—See Ruin.

Langres.—Marbles quarried at this locality, in the Upper Marne, France, have a ground of brownish grey, with numerous white semi-transparent fossils. Some varieties contain small yellow shells.

Languedoc.—This marble, also called St. Beaume, is a madrepore of a fiery red colour streaked with white and grey in convoluted bands or zones. It is quarried at Alais (Gard) and at Portes (Hérault), in the old province of Languedoc. See St. Beaume. Languedoc is found to resemble the antique marbles known as Cotonello, Fiorito, Purichiello, Rosso Annulato, Serpentelo, and Vendurino. A marble called Languedoc, having a ground of tarnished green with red spots, is quarried

at Figeac, in Aude ; and marbles similarly named, having a ground of pale yellowish green, are found at St. Alban, and other parts of Lozère, France.

Las Fons.—See Baixas.

Laugéat.—This marble, named after its quarry in the Upper Loire department, France, is red spotted with white.

Laurentian Limestone.—This is a material of a serpentinous character, quarried at Grenville, Canada. It exhibits various tones of sap green, and greenish and pinkish grey, in veins and zones of great beauty.

Lautenne.—The marbles quarried at this locality, in Namur, Belgium, have a ground of slightly greenish grey, with darker irregular spots and large white spots and veins.

Lauzanier.—Marbles bearing this name are quarried in the Lower Alps. Some have a white ground irregularly spotted with green, brown, and yellow, and are quarried at St. Vincent, which see. A variety found at Entrevaux has a grey ground veined with white, and takes a good polish.

Lauzet-Monetier.—See Portor.

Laval.—See Argentré and St. Berthevin.

Laveline.—This is a white marble named after its quarry in Vosges, France. It is difficult to work on account of the quartz and felspar which penetrate it.

Léardes.—This marble is quarried at Blavosy, Upper Loire, France. It is grey with white veins, and very hard.

Leek Marble.—This is an antique marble resembling serpentine, with a ground of light green shaded with blackish green, and with long green veins.

Léopard.—This marble, quarried at Philippeville, in Namur, Belgium, has a ground of reddish grey spotted with darker grey and black, with crystalline veins slightly tinged with bluish grey, and running like rivers upon a map. This resembles some marbles called Florence, which see.

Levanto.—The Levanto marbles, named after the locality of their quarries in Italy, are in masses of dark red and green, separated by clearly defined boundaries. Some specimens are of uniform colour in large sizes, of a fine marone red or olive green. Some bands and patches of pale green are found here and there.

Les Bains.—See Statuary.

Lescun.—At Lescun, in the Lower Pyrenees, is found a marble presenting shades of green slightly varied.

L'Improneta.—This marble, named after its quarry near

Florence, is green spotted with clear green, olive green, and brown.

Linghon.—This marble is grey with red veins, and is quarried near Ambleteuse, in Pas-de-Calais, France.

Lorrain.—This marble, quarried at St. Catherine, near Nancy, France, shows combinations of white, grey, yellow, red, and black, and takes a high polish.

Loubie.—A marble quarried at Loubie, in the Eastern Alps, is white with occasional grey veins.

Luçon.—This name is given to some marbles quarried at Gochenée, in Namur, Belgium. Luçon Chocolat has a ground of chocolate mingled with red, with occasional large grey veins and spots. Luçon Caillouté has a ground of dark grey spotted with pale grey, white, and red, in large blotches. Luçon, quarried in Vendée, France, is red, with spots of deeper red, black, and pale grey.

Lucs.—A granite is found at this locality in Vendée, France. It exhibits various shades of grey, blue, and red, and contains fossils.

Lumachella Castracani.—This is identical with Yellow Lumachella. It has a ground of very deep brown spotted with small bright orange rings, caused by fossil shells. The ancient quarries are lost.

Lumachelle des Bossus.—See Fontenelle.

Lumachelle Champenoise.—This marble, quarried near Rheims, in Marne, France, is yellowish grey, with numerous fossils.

Lumachello.—This term, or Lumachella, is applied to marbles which present figures caused by the section of small shells, so closely united as to form the body of the marble. The shells may be white, black, or greyish brown, and the material uniting them may be black, pink, yellow, or transparent white. The lumachello of Tuscany is of a dark brown colour, containing shells, and having brilliant sparkling reflections from within. It is sometimes called fire marble. The marble of Tortosa, in Spain, is composed of crushed shells, and is properly a lumachello, although it is called a brocatello. See Brocatello. A grey lumachello, or lumachelle gris, is quarried in the department of l'Aube, France. It exhibits large ammonites mixed with small shells, but its colour is not agreeable, although it takes a good polish. There is a clear grey lumachello quarried at Lourdes, in the Upper Pyrenees.

Lunel.—This marble is of a dull brown colour without much

marking. It is obtainable in large sizes, entire columns twelve feet long being made from it, and it harmonises well with red brick. It is quarried in the Vallée Heureuse, near Boulogne-sur-Mer, France. Lunel Fleuri, also found here, has a similar ground, but with markings of darker colour. Joinville, another variety of the same, is slightly marked with red patches and veinings. See Napoléon.

Luxullianite.—See Porphyry.

Madrepore.—Marbles called madrepores, or madreporic marbles, are those which contain fossils which produce the effect of white and grey spots, in the middle of which are small dots or stars regularly disposed. The St. Anne marbles furnish examples of this.

Malpas.—Marbles quarried at this locality, and at La Cluse, and Oye, near the lake of St. Pont, in Doubs, France, are fine-grained, of a flesh-colour spotted with bright red, and take a high polish.

Malplaquet.—This name is given to a marble quarried in the valley of Biros, in Ariège, France. It has a bluish grey ground with large black and pinkish white spots. A marble quarried at Malplaquet, Belgium, has a ground of pale reddish yellow, sprinkled with irregular patches of lighter colour, fringed at the edges with a darker tint. Another variety quarried here has a black ground covered with large reddish grey patches, shaded at the edges. This marble is known as *Première Qualité*, or First Quality, Malplaquet.

Manche.—Some marbles quarried near Iles Chaucey, in Manche, France, are white speckled with varied shades of grey, with some white and grey crystalline zones.

Mandelato.—This is a light red marble with yellowish red spots, quarried at Luggezzana, in the Veronese.

Margorre.—A bluish marble with brown veins is quarried at this locality, in Tuscany.

Marmière.—The marbles quarried at this locality, in Tuscany, comprise Caldana, which see, and Brocatelle de Sienne, which has spots of orange upon a ground of dark violet, and is very beautiful.

Marmora.—The marble quarried at the Isle of Marmora is of a greyish hue with stripes of darker grey. It is coarse, and of little use for decoration.

Marmoraja.—A marble quarried in this locality, in Tuscany, is yellow with veins and spots of darker yellow.

Marquise or Marquese.—See Napoléon and Stinkal.

Marston.—A remarkable madrepora is quarried at Marston, Somersetshire. It exhibits the outline forms of pale yellow ammonite shells, mostly spiral-shaped, and closely united in a ground of blackish brown.

Matifoux.—This marble, named after the neighbourhood of its quarry, in Algiers, has a grey ground, with sometimes yellowish or bluish shades. Sometimes it is spotted or brecciated. It is not highly esteemed.

Merbes-le-Chateau.—The marbles quarried in this locality, in Hainaut, Belgium, are of a dark marone red with white veins.

Mergozza.—A fine white marble with grey veins is quarried near Mergozza, Italy.

Middleton.—The marble quarried near Middleton and Churchtown, Co. Cork, Ireland, has a ground of brownish red with spots and veins of white and whitish red.

Miery.—A marble quarried at this locality, near Poligny, in Doubs, France, is a lumachello having a black ground and white fossil shells.

Migliarolo.—See Granite.

Mischio.—This Italian word, signifying mixed, is applied, properly speaking, to a violet or purple variety of Breccia Serravezza, which is penetrated by veins of iron ore. The term *mischio*, however, has been somewhat indiscriminately applied. *Mischio di Serra Valle* is of a dirty white intermingled with grey, black, and yellow. *Mischio di Marmaroja* is clear ash colour. *Mischio di Volterra* is grey intermingled with white and light red. *Mischio dei Conti* is pale grey with brown spots. *Mischio di Mitigliano* is pale red mixed with yellow. *Mischio* quarried in Brescian is pink mingled with white. *Mischio di Sienna*, found in Tuscany, is flesh-coloured mingled with white, and resembles alabaster. *Mischio di Frosini*, quarried near the Abbey of St. Galgano, is reddish with white spots. *Verde Mischio*, quarried near Padua, is green with black and white veins. Most of the above-named marbles are named after the situations of their quarries.

Mitigliano.—A breccia quarried at this locality, in Tuscany, has a ground of mingled yellow and grey, marked with white and brown. *Mischio di Mitigliano* exhibits combinations of yellow and pale red.

Molina.—Near this locality, in Spain, is an entire hill of a red, yellow, and white marble, having a coarse, granular texture.

Mona.—Mona marble is understood to consist of a combination of crystalline limestone and serpentine. It exhibits dark green, moderately brilliant green, and occasionally dark purple, blended irregularly with white, and it is of great beauty. It is quarried in Anglesea. See Rhôscolyn.

Moneyash.—Two kinds of marble are quarried at Moneyash, in Derbyshire. One has a ground of light mottled grey, while the other has a similar ground of a bluish tint. The former has purple veins, which spread out in elegant ramified forms, and both contain numerous fossil crinoid shells. See Derbyshire.

Mons.—See Petit Granite.

Montarenti.—At this locality, near Siena, Italy, is quarried a marble having a yellow ground with black veins, tending sometimes to purple.

Montbart.—This marble, quarried in the department of Côte d'Or, France, is a breccia spotted with white, red, and yellow.

Monte Corchia.—See Statuary.

Montel.—This marble, named after its quarry, in Lot, France, is blackish grey with green spots.

Monthricaux.—A black and red marble is quarried at this locality, in Lot, France.

Montmartin.—The marble called Brun de Montmartin has a ground of brown marked with white fossil shells. It is quarried at Montmartin, in Doubs, France. Some black and white marbles are also found here.

Montmirel.—A marble exhibiting combinations of brown, grey, and white, is quarried at Montmiral, in Tarn, France.

Montrichoux.—This marble is named after its quarry, in Tarn-et-Garonne, France.

Montrouge.—The marbles quarried here, in the Seine department, France, exhibit varieties of yellowish Isabelle, which see, with ramified tree-like markings.

Morgon.—See Gap.

Mosaic.—This name is given to a marble quarried at Moltifao, in Corsica. It exhibits a variety of coloured fragments, mostly dark, comprising grey, blue, yellow, red, and brown, all united with white veins. It takes polish unequally, and changes quickly on exposure to the air.

Mugnione.—Various marbles are quarried at this locality, in Tuscany. Amongst these are Alberese, or tree-like, which is of a clear yellowish white with fine lines and small spots

of black, arranged in tree-like forms. Nuvoloso di Mugnion is reddish grey. Giallo Liniato di Mugnion is yellow mingled with red, and veined in a manner resembling wood. Caia di Mugnion is an olive yellow brecciated marble, with small specks, and resembles wood cut from the root of a tree. Verde di Mugnion is of a tarnished bluish green, marked with olive yellow. A lighter variety is pale olive green with shades of reddish colour. Cosuale di Mugnion is a green brecciated marble with patches of reddish yellow, crossed by darker lines, which give it some resemblance to a woven fabric.

Mussel.—See Derbyshire.

Nanquin Coquilier.—This marble, quarried at Mentions, in the Upper Garonne, France, is of a warm whity-brown tint, and contains small fossils.

Napoléon.—The marbles bearing this name are of various brown tints, with veins of white, grey, and auburn. The marble called Marquise or Marquese is quarried in the locality of that name, near Boulogne-sur-Mer, France. It has a brownish grey ground, resembling the colour of coffee mixed with milk, with veins which vary between white and auburn. There are three varieties, the grey (gris), the pink (rosé), and the florid (fleuri). Sometimes the ground is of a fine ruddy brown. The kind called Napoléon des Vosges is quarried at Schirmeck, in the department of Vosges, where is also produced a brecciated marble called Brèche Napoléon. See Lunel and Stinkal.

Napoleonite.—This puddingstone marble, quarried in Corsica, has grey orbicular spots upon a dark grey ground.

Nero Antico.—This marble, known as Black Antique, or Noir Antique, is the original Grand Antique. It exhibits large angular and jagged patches and bands of black, dark grey, and white. Some small intensely black fragments are occasionally found. The ancient quarries have been lost. The modern Noir Antique is of a fine uniform black, and is quarried at St. Crépin, in the Upper Alps.

Neuvillette.—A marble called Bleu de Neuvillette is quarried at this locality, in Mayenne, France. It is white with blue veins.

New England.—The marble known by this name is quarried at Stainton, near Barrow-in-Furness. There are two varieties. One is of a light fawn-colour, without much veining, and the other is darker, with purple and brown markings.

Nivernais.—This name is given to a bluish grey marble quarried at Champ-Robert, Nièvre, France. Orange du

Nivernais is of an orange tint, and is quarried at Taveau, in the same department.

Noir Antique.—See Nero Antico.

Noir Jurassique.—This is a pure black marble, quarried in Jura, France.

Nonette.—A marble quarried at Nonette, in Auvergne, has a ground of pearl grey with fossil shells.

Numidian.—The only known quarry in the ancient African province of Numidia, is at Fillfila, where a white marble of ordinary quality is found; and it is supposed that the Marmor Numidicum of the Romans was so called from having been shipped at some Numidian port. The marbles now called Numidian are quarried at the Montagne Grise, near the village of Kleber, about twenty miles north-east of Oran, in the western part of Algiers. These marbles comprise a creamy white Marmor Bianco, a flesh-tinted Rosa Carnagione, a fine variety of Cipollino (see Cipollino), various specimens of Giallo Antico (see Giallo Antico); yellow marbles of various tints, including Giallo Avorio, Giallo Canarino, and Giallo Paonazzo; and brecciated marbles, including Breccia Sanguina, Breccia Coronata, Breccia Dorata, and Breccia Grande. The last-named is of a deep red colour, slightly brecciated, and resembling Rosso Antico, which see. These breccias are all of great beauty, take an even polish, and are mostly homogeneous, thus presenting no necessity for the use of lutes or stoppings. Algerian Onyx is also found here. See Onyx. All these marbles are shipped at Oran.

Occhiato.—This Italian word, which means full of eyes, is applied to a lumachello marble having a ground of violet colour with round fossil shells closely placed, and resembling eyes. It is quarried at Mora, in Venetia. Occhiodino resembles it, but the eyes are smaller. It is quarried at Cervenno. Another similar occhiadino is found at Bordogna.

Occhio di Pavone.—This marble, which is Peacock's Eye, or the French Œil de Paon, is a madrepore, having a ground of red inclining to yellow, in which the shells form large orbicular spots of red, white, and yellow. It is quarried in the neighbourhood of Verona. There is a similar antique marble bearing the same name.

Ogwell.—Among marbles quarried at Ogwell, in Devonshire, are specimens with a ground of dark reddish brown, with brown and grey spots and markings.

Oletta.—The marbles quarried at this locality, in Corsica,

exhibit three varieties. One has a ground of dark red, or marone, with white and sometimes yellow veins. Another has a yellow ground with mingled shades of red, white, and grey. A third variety has a blackish ground with small white or brownish veins.

Onhaye.—A marble quarried at this locality, in Namur, Belgium, has a ground of brownish black, mingled with paler shades, with grey spots and veins.

Onyx.—Onyx marble is to be distinguished from Oriental Alabaster, which has been mistaken for it. Onyx is translucent, usually of amber-colour blended with white. Some varieties are quarried at Ain Tekbulet, near Tlemçeu, in Algiers. Mexican Onyx, quarried at Pueblos, near Vera Cruz, presents great variety of colours, comprising white and amber, cloudy bluish-grey, and occasionally rich brown verging upon deep red. Large quantities are obtainable, but the uncertainty of demand has made it scarce in this country.

Opalescent Lumachelle.—The same as Bleiberg, which see.

Oriental Alabaster.—This is a calcareous substance which effervesces under nitric acid. It differs essentially from ordinary Alabaster, which see. It is much used in decoration, both on account of its beauty and the ease with which it is worked. It exhibits a ground of translucent white, tending in places to a reddish yellow, and is profusely marked with undulating bands and streaks of amber colour, tending in some cases to a dark reddish brown, and often resembling the grain of wood in its general effect. It is quarried in the neighbourhood of Alicant and of Valencia, in Spain, and of Trapani, in Sicily. Sienna alabaster, or Albâtre de Sienne, is of an uniform amber yellow, and is nearly transparent. It is quarried at Malta. Algerian alabaster is quarried in Algiers. It is of bright green, bright red, golden yellow, brownish yellow, pure white, and cream-colour. The name of Oriental Alabaster has been wrongly applied to onyx marble. See Onyx.

Orival.—This marble, named after its quarry in the Lower Seine department, France, is brown with black veins.

Ossau.—The marbles quarried in this valley, in the Lower Pyrenees, comprise some varieties of St. Anne, which see. Brèche Grise, or grey Breccia, pearly grey, &c.

Osseux.—This name has been given to a marble quarried near Verona. It shows a reddish and greenish ground, with large white spots caused by fossil bones.

Oye.—See Malpas.

Pacagne.—This marble, quarried at Gandrieux, in the Nord department, France, is of a clear ashy grey.

Palliato di Casentino.—This is a breccia quarried near Casentino, in Tuscany. It presents varied shades of yellow.

Palombino.—A dove-coloured marble with delicate white blotches, quarried at Carrara, is called by this name.

Panno di Morto.—This name, signifying a funeral pall, is given to an antique marble having a black ground with white shell spots about an inch long. It takes a high polish, and is called Black and White Antique.

Paonazzo.—See Giallo Antico.

Paragone.—See Bergamo and Black.

Parian.—See Statuary.

Paris.—The marbles quarried in the neighbourhood of Paris are mostly of a yellowish or brownish white, with brown or brownish grey spots.

Partridge-eye.—See Griotte.

Pavonazetta.—This antique marble derives its name from a supposed resemblance of its pattern to the plumage of a peacock. It is also called Phrygian marble. It exhibits bands of green in various shades approaching a bluish or greyish tinge, and alternating with bands of pure white. These bands follow, for the most part, wavy contours, occasionally interrupted with sharp breaks. The name Pavonazzo (which see), has often been applied to this marble.

Pavonazzo.—This antique marble is white, with spots of ruby red. The name is given to some modern marbles of Serravezza. See Serravezza and Breccia di Serravezza. See also Pavonazetta.

Peach-Blossom.—See Fleur de Pêcher and Fior di Persica.

Pech-Cardaillac.—A serpentine, quarried at this locality in Lot, France, combines varied shades of dark green, passing from olive to almost black.

Pembrokeshire.—The marbles quarried in Pembrokeshire, as at Carew-Norton and Williamston Park, are almost black. At Templeton there is a black marble with white outlines of fossil shells.

Pendant.—At the quarries named thus, near Pendant, in Lot, France, is a grey brecciated marble veined with red.

Penne St. Martin.—This is a brecciated marble quarried at St. Béat, in the Upper Garonne department, France. It shows combinations of white, yellow, and grey.

Pentelic.—See Statuary.

Périgueux.—This marble, named after the locality near which it is quarried, in Dordogne, France, has a ground of pale bluish grey, with varied shades of green and red.

Persecchino.—This name is given to two varieties of antique marble. Persecchino Grande has a white ground with lilac and violet-coloured spots, as much as a foot in diameter. It is sometimes called Violet Breccia, and this name is also applied to a marble having a brown ground with long violet bands and spots mixed with white. Persecchino Piccolo is like Persecchino Grande, only its spots are smaller. Some rare varieties have rose-coloured spots.

Petit Antique.—This marble has a blackish ground with white and grey veins running nearly parallel. The ancient quarries have been lost. Marbles now called by this name are quarried at Brabançon, in Hainaut, Belgium. They have a black ground with irregular grey and white spots and veins, tolerably evenly distributed. In some varieties the white spots are larger and more irregular, while the veins are larger and disposed in directions more or less parallel. In others there are fewer white spots, which, with the grey spots and veins, are more irregularly disposed. See Grand Antique and Nero Antico.

Petit Granite.—This is an encrinital marble quarried at Mons, in Belgium. It has a ground of dark grey, nearly black, with small light grey spots formed by sections of the fossil crinoid or stone-lily stems. It is not durable, and does not take a good polish.

Petit Tor.—Among marbles quarried at Petit Tor, Devonshire, are Yellow Clouded, having a ground of pale grey with grey and dark red veins, and slight dashes of yellow; Pink Clouded, having a ground of pale pink with patches of yellow and grey, and small dark brown markings here and there; and Dark Spot, having a ground of warm grey mottled like granite, with small black specks.

Peyrère (Le).—A red marble, spotted with white, is quarried at Peyrère, in Lozère, France.

Peysonnier.—Marbles called Peysonnier and Peschagnard, quarried in Isère, France, are dappled with large shades of grey, black, and white.

Pézénas.—A marble quarried near this locality, in Hérault, France, is brecciated with white, grey, and green.

Philippeville.—The marble called by this name, after the neighbourhood of its quarry in Algiers, has been identified with

the Numidian marble of the ancients. It has a yellowish ground, tending to reddish or pinkish hues, and has small accidental veins of black, reddish brown, and brownish violet. It takes a high polish, and is much esteemed.

Phrygian.—See Pavonazetta.

Pidichiasa.—See Trapani.

Pieds de Souris.—This name, which means mouse's feet, is given to a marble quarried at Montigny-Saint-Christophe, in Hainaut, Belgium. It has a grey ground spotted with paler grey, and with little white marks resembling the feet of mice.

Pierre Chaline.—See Argonne.

Pierre d'Etoile.—See Pietra Stellaria.

Pietra Stellaria.—This marble, quarried in the neighbourhood of Verona, is entirely composed of starlike madreporic shells converted into a grey and white substance. It will take a fine polish.

Pieva.—Brocatello della Pieva is spotted with white, violet, and flesh-colour, and is found at Molli, on Mount Arrenti, in Italy. It is much finer than the marble found at Gherardesca, which see.

Pisa.—Various marbles are found in this neighbourhood. Fiorito di Pisa has a ground of clear yellowish white with numerous black spots and small specks. Vert de Pise is pale greenish grey.

Pistoja.—Verde di Pistoja, quarried at this locality, in Tuscany, is of a deep olive green, marked with interlacing veins of more or less clear green. See Polveroso.

Plougastel.—Marbles quarried at this locality, in Finistère, France, exhibit various tones of bluish grey.

Poggio di Rossa.—The marbles quarried at this locality, in Tuscany, are yellow spotted with yellow and black.

Poligny.—In this neighbourhood, in Jura, France, some fine Oriental Alabaster is found. It is white and semi-transparent. Some varieties showing shades of yellow and red are also found here.

Polla (La).—See Statuary.

Poolwash.—The marbles quarried at Poolwash, in the Isle of Man, comprise the grey encrinital and the black flagstone. The former shows white star-like fossils upon a ground of grey, and is one of the most beautiful specimens of encrinital marbles. See Encrinital. The black flagstone has a few grey veins, and takes a good polish.

Polveroso.—This marble, which has a black ground sprinkled

with small white and grey spots, is quarried at Pistoja, in Tuscany.

Polzevera di Genova.—The same as Verde di Genova, which see.

Poppi.—A marble quarried at this locality, in Tuscany, is greyish green, brecciated and veined with yellow.

Porphyry.—This is a crystalline substance, which does not correctly rank as a marble, but which, in some of its varieties, is much used in marble decoration. It is extremely durable, but requires the aid of polish to display its beauties to perfection. The antique red or purple porphyry, from Upper Egypt, is called Porfido Rosso Antico by the Italians, and must not be confounded with Rosso Antico, which see. This antique porphyry has a ground of dark crimson or chocolate-colour, sprinkled with minute crystals. Black Antique Porphyry, or Porfido Nero Antico, has a ground of black with large white crystals. Some less valued specimens have small crystals. The quarries have been lost. Green antique porphyry has a ground of olive green, tending to dark, almost blackish green, with whitish green crystals of a medium size, and with occasional small bluish grey agates. This has been called ophite or serpentine by the ancients, and must not be confounded with Verde Antico, which see. This green porphyry is extremely rare. Porfido Bruno, or brown antique porphyry, has a ground of liver brown with large spots of greenish white. It has been found in Roman ruins. The term porphyry is applied to various rocks containing distinct crystals sprinkled through a fine-grained ground of black, green, red, brown, violet, and grey. Some varieties are quarried in Cumberland, amongst which are mottled dark red, grey, and pink, some specimens having a dark grey ground with white and dark red spots. Some fine porphyries are quarried at Shap, in Westmoreland. In Cornwall we have the Elvan varieties, mostly dark grey with black and white specks. At Launceston is found a steatic porphyry, with a ground of pale bluish silvery grey, mottled with white and grey, and sparkling with metallic lustre. The kind called Luxullianite, found at Luxullian, near Lostwithiel, has a ground sometimes of a dark brown, sometimes of bluish black, sprinkled with large flesh-coloured crystals. A porphyry with a reddish or flesh-coloured base, with white crystalline spots, is found at Tremore, near Bodmin. Another variety found in the same neighbourhood has a brownish red ground and light pink crystals. A beautiful reddish elvanite porphyry is found at

Barton and Ennis, between Bodmin and Truro. A kind found at Seveock Water, near Chasewater, has a grey granitic ground, with rose-coloured and radiating crystals. Other Cornish localities are Mayon, near Land's End, St. Austell, Camelford, and between Penhale and Bochin, where is a porphyry with a dark green ground and white crystals; and a fine porphyritic greenstone occurs at Boswednon Cliff, near Zennor. In Scotland, some beautiful rose-coloured porphyries are found among the Sidlaw and Lammermuir Hills, in the Pentlands, and near Lesmahagow. Some fine porphyries are also found between Blair Athol and Dalnacardoch, and on the south-west coast of the Isle of Arran. In Ireland, a porphyry found at Lambay Island resembles Verde Antico, which see. It has a dark green ground sprinkled with light green crystals. In France and Belgium the principal quarries for porphyry are those of Lessines and Quenast. Porphyre Vert des Vosges has a ground of dark green and numerous pale green crystals. It is quarried at Fresle, in Comté. For a similar kind of porphyry, see Granite Vert. Green porphyries, called Vert des Pyrenees, have been found at St. Engrace, near the bridge of Osse, to the north of Atas, and elsewhere. Porphyre Brun des Vosges has a ground of chocolate brown and numerous white semi-transparent crystals. It is quarried upon Mount Evres, near the Ballon. Porphyre Violet des Vosges has a ground of deep blackish violet, with good-sized crystals. It is quarried at Mount Ocelle. Another variety is found near Plancher-les-Mines, and resembles the last-mentioned, but its crystals are smaller. A dark grey porphyry, containing numerous yellow and reddish crystals, is found at the Mountain of Lechelatton, in the Vosges. Porphyre Noir des Vosges is found at Framont, and is black, as its name imports. A kind called Gris de Briançon, is of a dark greenish grey, with white spots slightly tinged with green. A reddish brown porphyry is found at Roanne, in the Loire department. It has white crystals which are grey in the centre. The island of Corsica produces several varieties of porphyry. Amongst these are black, having crystals slightly tinged with green; deep bottle-green with white crystals, quarried at Nioto; flesh-red with white crystals slightly tinged with pink; blackish brown with brilliant flesh-red crystals; violet, or deep lilac, with red and brown spots and some green lines; deep grey with white crystals and small black dots, found at Bussaggio; deeper grey, and having more numerous crystals, found at Calvi; and brownish yellow with red crystals. A black porphyry is found

in Sardinia. Some fine porphyries are quarried in the neighbourhood of Geneva. Amongst these we have the opaque black with white spots, and the clear, semi-transparent green with white crystals. Among the mountains of Piedmont are quarried a porphyry resembling Verde Antico, and a leek-green porphyry with white and red spots, found at Mount Viso. In Sweden some varieties of porphyry are quarried at Elfdahlen. These exhibit grounds of red, blue, violet, and grey, and contain, in addition to variously coloured crystals, iron pyrites and specular ore. Some of these porphyries are found in the south of Norway, and some quarried at Leune-Gebiet, in Westphalia, Germany, resemble them. Other German resources for porphyry are in Saxony, Thuringia, and the southern borders of the Hartz Mountains. For Greek porphyry, see Laconian Marble. There is a porphyry found in Egypt which has a ground of deep red, and which contains two varieties of crystals. The more celebrated Egyptian porphyry is Roseo Antico, which see. An extremely rare black porphyry, with white crystals and small grains of quartz, is found in Siberia. A red porphyry, quarried in Cordova, Spain, has a ground of very dark red, which occurs in patches, more or less dark, here and there, and small crystals barely visible. It is not very attractive in appearance. Further varieties of porphyry will be found noticed under their specific names.

Port Etroit.—This name is given to a black marble quarried at Juigné, in Sarthe, France.

Porth Felen.—The marbles quarried at Porth Felen, Caernarvonshire, exhibit patches of pink, brownish grey, and whitish pink tinged with yellow, with marks of dull red.

Portor.—This name is given to marbles having a black ground and yellow veins, sometimes of a golden appearance. The original portor is quarried at Porto Venere, in the Apennines, and in the Isle of Palmaria. A fine portor is quarried at St. Maximin, in Var, France. Another is found at La Grande Chartreuse, in Isère; and a brecciated variety, exhibiting pink and violet spots, is found in the same locality. A portor is quarried at Lauzet-Monetier; and another, called Portor de Rezoul, at Rezoul, in the same neighbourhood. Blackish and rose-coloured varieties of portor are quarried at Chorges, in the Upper Alps. A violet-coloured and brecciated portor is quarried at Guillestre; and a brèche portor, having black fragments surrounded with white and brownish veins, is found at St.

Crépin. A portor and a brèche portor are found near Philippeville, in Algiers. See St. Maximin and St. Paul.

Portor d'Espagne.—This marble comes from Biscay. It has a ground of dark, dirty grey, with veins of a red-ochre tint.

Poudingue.—This term, equivalent to the English pudding-stone, is applied by the French to those brecciated marbles in which the fragments are rounded instead of being angular.

Poudingue Universel.—This is a name generally given to those puddingstone marbles which exhibit a great variety of colours. A marble called Poudingue Universel, quarried at St. Amour, in Jura, France, has spots of grey, yellow, green, red, and brown, and resembles Alet Breccia, which see. See also Désert (Le).

Poudingue Vert.—See Désert (Le).

Poujade (La).—At this locality, near Loubressac, in Lot, France, is quarried a red marble resembling Aynac, which see, with occasional white veins.

Pratolino.—Various marbles are found at this locality, in Tuscany. Liniato di Pratolino is greyish green with bands and veins. Verde di Pratolino is of a dirty green resembling the boughs of a palm-tree, and must not be confounded with Verde di Prato, which see. Tagliaferro is greyish green with bands and veins. Another marble found here shows blended shades of green and pale red.

Puit Real.—This marble, named after its quarry, in Vaucluse, France, is of a bluish grey tint. Another variety, called Bédouin, is also quarried here as well as a white marble.

Pulteau.—This marble, named after its quarry in Vendée, France, is greyish-white, shelly, and crystalline.

Purbeck.—This shows a number of minute fresh-water shells embedded in a dark bluish grey limestone, which is very hard and compact and takes a good polish. It is quarried in the Upper Purbeck beds of Swanage, in Dorsetshire, and can be obtained in blocks seven or eight feet long, but rarely more than a foot in thickness. Experience has shown that Purbeck marble is not so durable as the older marbles of Great Britain. A specimen of so-called Purbeck, quarried in the Isle of Man, has patches of dark grey and brown, with networks of dark red and cream-coloured veins.

Purichiello.—See Languedoc.

Puycavel.—At this locality, in the Commune de Larnagol, Lot, France, is found a brecciated marble with a yellowish brown ground, which takes a good polish.

Py.—See Statuary.

Racine de Buis.—See Argonne.

Radon.—The marble bearing this name is quarried at the Forêt d'Écouves, in Orne, France. It is blackish or slightly bluish grey, with white and grey veins and thin yellow lines. It occasionally contains iron pyrites.

Radstock.—A marble quarried at Radstock, Somersetshire, has a ground of light grey tinged with brown and pale grey veins.

Ravaccione.—See Sicilian and Statuary.

Regnéville.—The marbles quarried in this neighbourhood, in Manche, France, vary in colour from black to whitish grey, and take a good polish.

Regny.—Marbles quarried at this locality, in Loire, France, are bluish black and black and white. The latter take a good polish, but are soon discoloured by exposure.

Rezoul.—See Portor.

Reyrevigne.—The quarries in this locality, in Lot, France, yield large quantities of marble with a grey ground slightly approaching yellow, and profusely veined with bright red.

Rhondona.—A marble quarried at Mount Rhondona, Tuscany, has a ground of pale pinkish white, with dark grey veins and tinges of greyish purple. It is of great beauty.

Rhôscolyn.—This marble is named after its quarry in Anglesea. It has a ground of very dark green with delicate lines and veins of dark grey. See Mona.

Rochette.—The marble quarried at this locality, in Pas-de-Calais, France, is black with grey veins.

Roquebrune.—A marble quarried in this neighbourhood, in Hérault, France, is brecciated with red, yellow, and violet.

Roque-Partide.—This marble, named after its quarry in Gard, France, has a ground of yellowish white, lightly clouded with grey.

Rosa Carnagione.—See Numidian.

Rose Antique.—This name is given to a brecciated marble, having a ground of light red variegated with small rose-red spots, with other still smaller spots of a deep black, and some middle-sized white spots. The ancient quarry is lost, and the marble is very scarce. This marble must not be confounded with Roseo Antico, which see.

Rose-Eujugeraie.—This marble has a red ground interspersed with patches of pearly grey, and with bright red and white veins. It is quarried at Bonéro, near Mayenne, France. It is exceedingly compact, is fairly easy to work,

takes a good polish, and is obtainable in large sizes with few defects.

Roseo Antico.—This is a porphyry quarried near the first cataract of the Nile, in Egypt, and also in the deserts near Mount Sinai. It has a reddish brown or chocolate base, sprinkled with small white crystals which ought to be free from any tinge of rose-colour.

Rose Venus.—This is a flesh-tinted marble with greenish spots and yellow veins. It is quarried near the village of Borba, in Portugal.

Rosé Vert.—This marble, quarried near Brioude, Upper Loire, France, shows combinations of pink, green, yellow, and a little violet. A bluish grey marble is found in the same locality.

Rosewood.—See Ashford.

Rosso Annullato.—See Languedoc.

Rosso Antico.—This marble, called also Rouge Antique, has a ground of blood-red with thin white veins and minute white dots. It is identified with the *Ægyptium* of the ancients. Specimens of Griotte have been mistaken for it. The ancient quarries have been rediscovered at Cynopolis, Damaristica, and Lageia, in Greece, from whence Rosso Antico is now obtained. Some varieties found at Lageia incline to brownish-red with black, white, and grey veins, and are not much esteemed. Rosso Antico is also quarried near Rome.

Rouge Acajou.—This term, signifying “red mahogany,” is applied to a marble quarried at Cierp, in the neighbourhood of St. Béat, in the Upper Garonne department, France. It is rose-coloured and mottled, takes a good polish, and is obtainable in large sizes.

Rouge Antique.—This is the French name for Rosso Antico, which see. A marble called Rouge Antique is quarried at Cierp, and in the neighbourhood of Villerembert, in the Upper Garonne department, France. It closely resembles Rosso Antico. The specimens found at Cierp are coarser in appearance and take a less fine polish than those found at Villerembert, but the latter place only produces small blocks of little service for architectural purposes.

Rouge d’Alais.—This is a speckled marble of a reddish colour quarried at Alais, in Gard, France.

Rouge de Fontaine.—See Gandrieux.

Rouge Français.—This marble, quarried at Liessies, in the Nord department, France, has a ground of varied red, with white veins, and black and red spots. Some varieties of it resemble Rosso Antico.

Rouge Joyeux.—This marble, quarried at La Doix, in Côte d'Or, France, has a ground of pinkish white, evenly speckled with pinkish violet.

Rouge Royal.—This marble, quarried at Franchimont, near Philippeville, Belgium, has a ground of light brownish red with white and grey veins. Another similar variety is found at Saint Hubert, in Luxembourg. Another, of which the ground is a darker red, is found at Cerfontaine, in Namur, and another at Agimont. A variety found at Vieux-Gochenée has a ground of deep brick-red, spotted irregularly with grey and white, toned off at the borders, but marked off strongly against the ground. Three other varieties are quarried at Hainaut, having a ground of very deep greyish red, with spots of unequal sizes of reddish and greyish white. In some specimens the ground is of a clearer red, while others exhibit bright red worm-like fossils. A variety quarried at St. Gérard has a ground of chocolate colour veined and spotted with creamy chocolate and light brown. Rouge Royal is among the finest of the Belgian marbles.

Rousselet.—See Bonnardellière.

Ruban Bleu.—See Ardinghen.

Ruin.—This name, or Landscape, is given to a marble quarried at Florence. It exhibits varied shades of light, warm brown, not blended, but forming patterns like the grain of wood. Sometimes there are zones of pale grey, nearly white. Some broken patches of brown resembling the outlines of ruined buildings have given the name to this marble.

Russ.—The marbles quarried at this locality, in Vosges, France, contain numerous fossils. Russ Brun is brown, and Russ Vert exhibits mingled shades of brown and green.

Sablé.—The marbles known under this name, and quarried near this locality, in Sarthe, France, comprise black, streaky grey, St. Anne, and Sarancolin. The two latter resemble those of the same names. See St. Anne and Sarancolin. A red marble, spotted with black and white, and a yellow one with red and white veins, are found at Sablé.

St. Ambrosio.—This marble, quarried in the neighbourhood of Verona, is of a light mahogany reddish brown, with numerous oval patches of light red more or less closely arranged. It is obtained in large sizes.

St. André.—See Ain.

St. Anne.—This name applies to two sorts of marble. The first has a ground of dark grey with whitish spots, amongst

which are madreporic fossils. The second has a ground of lighter grey, with irregular and dirty spots. A great quantity of the best St. Anne marble is quarried in the province of Hainaut, Belgium, as at Laval-Chaudeville, and at Montigny-Saint-Christophe. Some varieties found at the latter place have spots of a worm-like appearance. A variety called Brayelle has a black ground tinged with light red or orange, and spotted with white and grey. It is quarried at Brabançon. A variety quarried at Fontaine-Valmont is somewhat similar. In France, Sainte-Anne Français is quarried at Cousolre, in the Nord department, and Sainte-Anne Hergies and Sainte-Anne Hurtebise, at the places with those respective names in the same department. Sainte-Anne des Pyrenees is quarried in the valley of Ossau, in the Lower Pyrenees.

St. Béat.—See Statuary.

St. Beaume.—This is the same as Languedoc, which see. A marble quarried in the mountain of St. Beaume, in Bouches-du-Rhône, France, is of a dirty white streaked with red, and is called St. Beaume. A brocatelle de St. Beaume, quarried in the same locality, has a white ground marked with yellow and red. A yellow brèche de St. Beaume is quarried at St. Beaume, in the department of Var. Another marble called St. Beaume is quarried in the valley of Aure, Dordogne, France. It exhibits shades of yellow and red intermingled with white.

St. Berthevin.—This marble, named after its quarry, near Laval, in Mayenne, France, is speckled with red, white, and slate-blue.

St. Briec.—A granite bearing this name is quarried near St. Briec, in Côtes du Nord, France. It is grey, fine-grained, contains much mica, and takes a good polish.

St. Catherine.—A red and white marble is quarried at this locality, near Nancy, France. A brèche St. Catherine is also found at St. Catherine, in Mayenne.

St. Crépin.—St. Portor.

St. Etienne.—This marble, named after its quarry in the Lower Seine department, France, is yellow, marked and spotted with deeper yellow, sometimes with tree-like markings. A so-called onyx marble, blackish with white veins, is also found here.

St. Firmin.—This marble, named after its quarry in Valgodemard, in the Upper Alps, is a lumachello, exhibiting combinations of grey, black, and white.

St. Fond.—A marble thus named after its quarry in Hérault France, is white with grey veins.

St. Fortunat.—A black marble is quarried at this locality, in the Rhône department, France.

St. Hugon.—This marble, named after its quarry in Isère, France, is black with white veins.

St. Jean.—This name is given to a variety of marble quarried at Rousset, in Bouches-du-Rhône, France. It exhibits combinations of red, yellow, and grey. Other marbles quarried in the same locality are the pink (rosé), showing combinations of blue, white, grey, and pink, and the brown (grand brun), showing combinations of grey, brown, and white. All these marbles are much esteemed.

St. Julien.—The marbles quarried at this locality, in Loire, France, are white, grey, and black. A yellow, white, and green St. Julien is found at Lozère.

St. Just.—A serpentine of this name, quarried at St. Just, in Loire, France, is green with greenish white veins. A statuary marble is also found here.

St. Luce.—This marble, named after the neighbourhood where it is quarried, in Isère, France, is of a fine uniform black.

St. Maurice.—The marbles quarried in this locality, in the neighbourhood of Gap in the Upper Alps, comprise varieties having a white crystalline ground tinged with pink and green. A Cipolin de St. Maurice is white with large green veins. See Eglier du Roi.

St. Maximin.—The marbles quarried at this locality in Var, France, comprise Portor, which see, and a yellow speckled marble called St. Maximin.

St. Pallaye.—This marble, named after its quarry in Cher, France, has a red ground veined with white.

St. Paul.—This marble, named after its quarry in the Lower Alps, has a ground of dark purple with spots of violet hue. Portor de St. Paul, found in the same locality, has a ground of blackish, grey, and white and yellow veins. See Portor.

St. Pons.—A white marble of inferior quality is found at St. Pons, in the Hérault, France.

St. Quentin.—This marble, named after its quarry in Isère, France, exhibits various shades of grey and slate-blue.

St. Remi.—This marble, quarried at St. Remi, in Aveyron, France, has a ground of clear yellow speckled with violet, and with crystalline fragments.

St. Remy.—This name is given to a variety of marbles quarried in Bouches-du-Rhône, France. Most kinds exhibit combinations of white, yellow, and red, and are very beautiful.

One variety is found at Aiguilière, near Tarascon, and another at Oreilles.

St. Romain.—This is a breccia, having a ground of dull brick-red, with angular spots of egg-yellow. It is quarried at St. Romain, in the department of Côte d'Or, France.

St. Saveur.—See Statuary.

St. Serges.—This name is given to black marbles with white veins quarried at St. Serges, in Sarthe, France. An encrinital marble, exhibiting red, grey, and brown hues, and a reddish madrepore, are also quarried here.

St. Silvester.—This is a marble of great beauty, exhibiting combinations of delicate pink and semi-transparent white. It is quarried near the town of Villa Nova d'Ourem, Portugal. It is fairly sound, takes a good polish, and is not difficult to work.

St. Simon.—This marble, named after its quarry in Lot, France, shows combinations of grey, yellow, and red.

St. Urcisse.—This marble, named after its quarry in Tarn, France, is greyish white with grey veins.

St. Vincent.—The marble quarried at St. Vincent's Rocks, near Bristol, exhibits undulating bands of pale flesh-pink tinged with yellow, bands of light, iridescent, drabish brown, with veins of rose colour, and narrow streaks of dark wine red.

St. Vincent (France).—The marble called by this name, after its quarry in the Lower Alps, is rather soft. It has a ground of white mingled with pink and yellow, and spotted with grey.

San Calogero.—This marble, named after its quarry near Sciacca, in Tuscany, is green with yellowish undulating lines.

San Gavino.—This marble, named after its quarry in Corsica, is of a greyish white with black and violet veins.

Sanguin.—See Ardinghen.

Santète, or Sans-tête.—This is a black and white marble quarried in the neighbourhood of Bourbon-l'Archambault, in Allier, France.

Sarancolin.—This marble has a ground of blood red with large spots of greenish yellow, and large vein-like patches of white. It is quarried at Ilhet, in the Upper Pyrenees, where there are four recognised varieties: the dark, the clear, the flesh-coloured, and the golden. Brèche Caroline, quarried at Bagnères de Bigorre, in the Upper Pyrenees, is a similar marble. See Beaudean Breccia. Sarancolin de l'Ouest, quarried at Gleen-Bauère, in Mayenne, France, is in two varieties, red and yellow.

Sassenage.—A marble quarried at this locality, in Isère, France, exhibits combinations of white, grey, and yellow.

Saupan.—This name is given to marbles having a pale and cherry-red ground with veins and white spots. They are quarried at Rocologne, near Besançon, in Doubs, France.

Sauveterre.—A marble quarried at Sauveterre, in the Lower Pyrenees, has a black ground with white spots.

Scuro.—This Italian word, as applied to marbles, means shadowed or dark.

Scuro del Porto Venere.—This is the same as Portor, which see.

Seissin.—The marbles quarried at this locality, in Isère, France, comprise black, and a Brèche de Seissin, having a ground of bright yellow with black spots, with streaks and lines of less decided black running parallel between them.

Seme Santo.—See Arlecchino.

Senantes.—A yellow lumachello marble with grey fossils is quarried at this locality in Oise, France.

Serancoline.—See Sarancolin.

Serpentelo.—See Languedoc.

Serpentine.—This substance is not properly a marble, but it is extensively employed in marble decoration. It is called gabro by the Italians. Noble or precious serpentines are those which possess a certain degree of transparency, being of a dark and sometimes olive green colour. Large quantities of serpentine are brought from the Lizard, Cornwall. It is chiefly of a deep olive-green, variegated with bands and blotches of rich brownish red mixed with lighter tints. This variety is obtained from the Balk near Landewednack, at Kynance Cove, at Signal-Staff Hill, near Cadgwith, at Cennack Cove, St. Keverne, and on Goonhilly Downs. Serpentine with an olive green base with greenish white veins is found near Trelowarren. A variety with a deep reddish brown base, studded with crystals which shine with metallic lustre, is found at Maen Midgee, Kerwith Sands. In Anglesea, a greenish serpentine, sometimes slightly reddish, is found at Llanfechell and Ceryg-moelion. A brecciated serpentinous marble with white veins is found at Tre-gala, near Llanfechell. In Ireland there are two varieties of the serpentine called Connemara marble. One, which is quarried at Letterfrack, is of a dense, opaque, and uniformly deep green colour. The other exhibits twisted and interlacing bands of green, varying from deep sap green to pale yellowish green, with interlacing bands of white. It is quarried at Ballynahinch, at Lissoughter Hill, Recess, and Streamstown. A dense, olive green serpentine is found at Aughadovey, and a foliated

green variety with yellowish green veins, at Crohy Head, in County Donegal. A deep leek-green serpentine is quarried at Rock Wood Glen, county Sligo. In Scotland the serpentine obtained from Portsoy, Banffshire, varies in colour from sap green to deep red, and has veins of yellowish white. Serpentine is also found in the Alie Hills, Aberdeenshire, at Killin, Perthshire, and in the Shetland Islands of Unst and Fetlar. Serpentine is found at Waldheim, Greifendorf, and Zöblitz, in Saxony, in Moravia, at Hrubtschitz, and from the Reichenstein, in Silesia. The serpentine of the Vosges Mountains at Epinal varies in colour from red to green, and contains iron ore. Some noble serpentine occurs here. In the Alps, serpentine occurs among the rocks of the Matterhorn, the Breithorn, the Alpe la Mussa in Piedmont, &c. It is also found in the cantons of the Grisons and Wallis, and in the Sierra Nevada in Spain. In France there is a breccia of serpentine embedded in carbonate of lime of a light green colour, and quarried at St. Vêran and at Maurins in the Upper Alps. Serpentine is found at Pech-Cardaillac and at Vêran and Estival, near St. Céré, in the Upper Alps; at Arvien, Canton de Cassagnes; in the Zermatt Valley, Switzerland; and at Bivincio, near Bastia in Corsica. In Italy, serpentine is obtained from Susa in Piedmont, Val Sezia, Val di Pegli, Pietra Lavezzara, near Genoa; and Prato, near Florence. A serpentine called Euphotide, of varied colours, is found at Matarana, near Genoa, and at Beverone. The Greek serpentine from Tenos is of a bright green colour, with whitish green veins, and occasionally iron pyrites embedded in it. Serpentine is quarried at a variety of localities in the Ural Mountains. In the south of India it also occurs. Varieties of Italian serpentine are known under specific names. See Verde Antico, Verde di Genova, Verde di Pegli, and Verde di Prato.

Serravezza.—The marbles quarried at Strazzema, near Serravezza, Italy, are mostly white with purple veins and occasional red spots. One kind is called Pavonazzo. See Pavonazzo. There are brecciated varieties. See Breccia di Serravezza.

Shepton Mallet.—The marbles quarried at Shepton Mallet, Somersetshire, are mostly dark grey, dark brown, almost black, and greyish brown, light and dark. Some have faint grey spots and marks.

Sicilian.—Marbles called Sicilian or Ravaccione are those well known white marbles marked with bluish grey veins, and quarried in the neighbourhood of Carrara. The name Sicilian is stated to have arisen through the marble having been origin-

ally reshipped at some port in Sicily, or from its having been first brought to England in a vessel named *Sicilia*. Two well-known kinds are the veined and the clouded. The former is white with well-defined bluish veins resembling those visible upon the human body. The latter is more of a pale grey than white, and its veins are blurred and clouded. See *Statuary*.

Sicilian Jasper.—This is a marble quarried in Sicily. It has a red ground with zigzag bands of white, red, and sometimes green.

Sidi-Yaga.—This marble, named after its quarry, near Bougie, in Algiers, is black with white veins, and takes a good polish.

Sienna.—The marbles quarried at Sienna and Montarenti in its neighbourhood are mostly of a rich yellow, resembling the yolk of an egg, which occurs in large irregular patches interspersed with thin veins of bluish red and purple. The veins of the Montarenti marbles tend to black. In the Sienna brocatello, the veins are extremely numerous and interlaced. Some varieties of Sienna tend to a reddish hue. Where the ground is of a rich colour, the veins are usually less strongly marked than when the ground is paler. A marble called Sienna is quarried in King's County, Ireland, but it is inferior to the Italian kind.

Sienna Alabaster.—See *Oriental Alabaster*.

Signa.—The marble named thus, after its quarry in the Upper Pyrenees, France, has mingled shades of brown and green and red spots. See *Brèche des Pyrenees*.

Skye.—The marble quarried at the Isle of Skye is of a greyish hue, veined.

Sobre.—The marble found in the quarry of Pacagne, at Sobre-St.-Géry, near Beaumont, in Hainaut, Belgium, is of an ashy grey tinged with blue, with black spots and veins of white and rich yellow.

Solestré.—A marble quarried here, in the department of Saône-et-Loire, France, is red with white marks and patches.

Soulane.—The marbles quarried at Soulane, in Corrèze, France, are mostly white with grey veins. Some called granite, chiefly mottled grey, sometimes with a tinge of pink, are quarried in the same locality.

Spontin.—The marbles quarried at this locality in Belgium have mostly a black ground speckled with grey and marked with white fossil crinoids, which generally form parallel lines.

Statuary.—This name has been bestowed upon white marbles, free from spots or veins, because they are most suitable for statues. In Italy large quantities of statuary are quarried

at Carrara, but the specimens require careful selection to avoid the liability to discolouration. Statuary is also quarried at Serravezza. At each of these localities three varieties of statuary are recognised, namely; Falcovaia, La Polla, and Ravaccione di Altissimo, at Serravezza; and Crestola, Betogli, and Ravaccione di Carrara, at Carrara. Falcovaia, which ranks as the first quality, is of a uniform creamy white. The marble of Monte Corchia resembles it. The Crestola of Carrara is scarcely inferior to it. It is found at Crestola, Poggio-Silvestro, Torano, Miseglia, &c. The marbles of the second quality, quarried at La Polla and Betogli, are of a not very uniform white. The marble of the third quality, called Ravaccione, is known as Sicilian, which see. Some of the purest white statuary marble is quarried at Massa. Statuary is also quarried at Monte Candido, near the Lago Maggiore, at Verona, and in the Schlanders. A fine close-grained statuary is quarried at Onofrio, in Corsica. In France some of the best statuary is quarried at St. B  at, in the Upper Garonne, and in the Eastern Pyrenees, at Els Gitanos, El Llop, El Buix, Les Bains, Valmagne, Py, Arles, Buixater, Carol, and St. Saveur; also at Flumay, in Is  re. Specimens free from veins are, however, extremely rare. In Algiers the best statuary is found at Filfila. But it is from Greece that the finest statuary has come. That quarried at Paros, and known as Parian, is probably the finest in the world. On being freshly broken it shows a sparkling play of light, more brilliant than that which comes from the fractured surface of Carrara marble, and this enables an experienced mason to distinguish between the two materials. The Pentelic marble is from the quarries in Mount Penteles. Pentelic is inferior to Parian, and it is found that the former exhibits in time a brown discolouration, which is due to the sulphuret of iron contained in it, and to which Parian is not liable. Other sources of statuary are Scio, Samos, and Lesbos. The marble from Tenos is white, but opaque. Some of the quarries of Greece have been worked within recent years. In India, statuary marble is found at Delhi, Gya, Jeypore, and Judpore, and in Jinevelly and Nerbudda. A white statuary is quarried at Blairgowrie, in Scotland.

Stinkal.—This name is given to two varieties of marble quarried in the neighbourhood of Marquise, Pas-de-Calais, France. One is dark bluish grey and the other is whitish grey speckled. See Napoleon. Some varieties called Stinkal have a ground of yellowish brown with brown spots. Stinkal Dor   has a golden tinge.

Straw-green Breccia.—See Verde di Pagliocco.

Sussac.—A grey marble containing mica is quarried at this locality, in Upper Vienne, France. A fine green serpentine containing metallic diallage is also found here.

Sussex.—The Sussex marble, which is quarried in Kent as well as in Sussex, resembles Purbeck (which see) in structure and appearance. Like Purbeck, it occurs in beds rarely exceeding a foot in thickness, and is not remarkable for durability.

Suzon.—This marble, named after its quarry in Côte d'Or, France, exhibits varied shades of grey and light brown.

Swansea.—The Swansea marbles are mostly of a dark greenish grey with white and yellowish marks and spots. Some varieties are quarried at Coltshill.

Syenite.—See Granite.

Tagliaferro.—See Pratolino.

Taormina.—The marbles quarried at this locality, in Tuscany comprise red spotted with black, red spotted with darker red and with white, and red spotted with black and white.

Taveau.—This marble, named after its quarry in Nièvre, France, shows black mingled with slate-blue. For other marbles quarried here, see Cannelle, Faux, Cervelas, and Nivernais.

Templeton.—See Pembrokeshire.

Tensin.—A marble quarried at Tensin, in Dauphiné, France, is of a clear grey with spots of cloudy rose-colour and chocolate brown. It takes a high polish.

Theux.—A marble quarried at this locality, in Liege, Belgium, has a ground of deep grey, blended in varied shades, with angular black spots.

Tipperary.—A fine purple marble is found at Tipperary, Ireland.

Tiree.—The marble quarried in the hill of Belepheirich, in Tiree, one of the Hebrides, exhibits pale blood red, light flesh red, and reddish white, with spots of dark green.

Tonni.—A marble quarried at this locality, in Tuscany, is variegated with yellow, violet, and white.

Tortosa Brocatello.—See Brocatello.

Tournon.—Several marbles are quarried in the commune of Tournon, in Lot-et-Garonne, France. Marbles of a fine yellow colour, with tinges of colours approaching to pink and violet, are found at La Marquise. Some florid yellow, “jaune fleuri,” and spotted yellow varieties are also found here. At Clairac is found a bright yellow marble with numerous small interlac-

ing grey veins. A bright yellow brecciated variety is found here, with white veins and crystalline fragments. At Perri-cara is found a marble with a pale yellow ground, with red and brown veins. At Frouquet are some fine brecciated marbles of a yellowish white, with brownish grey veins and spots. Most of these marbles are obtainable in large sizes.

Trapani.—A variety of marbles are quarried near this locality in Sicily. Bigio Bianco is grey with white spots. An olive green marble is quarried in the neighbourhood. A marble called Trapani is reddish brown mixed with white and green marks and patches. Another, called Pidichiasa, has a ground of red with golden yellow spots. It is also called Brocatelle de Sicile. Another brocatello, quarried in the same neighbourhood, exhibits mixtures of reddish brown, and clear red mingled with white, with yellow spots. Brèche Rose de Trapani is of great beauty, of bright flesh colour, veined with yellow and white. Verde di Trapani is green with bands of yellow.

Tray.—This name, or Trest, is given to a marble quarried in the locality so called in Bouches-du-Rhône, France. It shows varied shades of yellow, with grey, white, and red spots.

Trelon.—The marble quarried at Trelon, in the Nord department, France, is deep red, shaded with white, pale red, and darker red.

Trespoux.—See Cornac.

Trest.—See Tray.

Troncao.—The marble quarried at Troncao, Portugal, is pale yellow with greyish veins and contains fossils.

Turchinecchio.—This name, or the French Bleu Turquin, applies to a marble having a ground of deep, clear blue, with large semi-transparent white veins. It is quarried at Carrara, and at Seraggio in Corsica. It is rather liable to fade and turn yellow.

Turchino di Rossa.—This marble, quarried at Rossa, in Siena, Italy, is blue with grey veins.

Urfé.—At this locality, in the department of the Loire, France, some greyish blue marbles are found.

Vaglis.—A marble quarried at this locality, in Verona, and known as Vert de Vaglis, is green in varied shades in flowing wave-like forms.

Valencia.—The quarries in this locality in Spain produce a dull violet-coloured marble with orange yellow spots and a dull red marble with black veins.

Valmagne.—See Statuary.

Vallerano.—See Black.

Vancelle.—A marble quarried at this locality in Namur, Belgium, has a ground of slightly pinkish grey, with rather dark grey crescent-shaped spots, caused by fossils.

Vareilles.—This marble, named after its quarry in Vienne, France, is blue and white and takes a high polish.

Variegated.—This term is applied to marbles presenting varieties of colour in irregular spots and veins.

Vein.—This name is generally given to the ordinary white marble with bluish grey veins, quarried in the neighbourhood of Carrara. See Sicilian.

Vendurino.—See Languedoc.

Ventre de Biche.—This marble, quarried at Sirod, in Jura, France, has a ground of light greyish brown and red spots.

Verde Antico.—This name, or the French *Vert Antique*, is given to a beautiful brecciated serpentine, several specimens of which are found among ruins at Rome and elsewhere. The best quality has a grass-green ground, with spots nearly black, of noble serpentine. The best modern substitute for *Verde Antico*, and often mistaken for it, is quarried in Anglesea. See *Serpentine*. Egyptian Green has also been mistaken for *Verde Antico*. See *Egyptian Green*. Red spotted *Verde Antico* has a dark green ground with small red and black spots, and occasional white fossil encrinital fragments. It is extremely rare, and only found in small fragments. Some specimens of *Verde Antico* are pale, cloudy green.

Verde d'Egitto.—The same as *Egyptian Green*, which see.

Verde di Genova.—This stone, called also *Polzevera di Genova*, or in French, *Vert de Gênes*, is a brecciated serpentine, having leek-green, dark green, brown, and red fragments, united in a ground of greenish white. It is quarried at *Pietra Lavezzaria*, in Genoa. Another variety, quarried at *Porto Venere*, Piedmont, has a ground of dark green with black and white spots.

Verde di Pagliocco.—This is a breccia having a straw-green ground with green and yellow spots. It is only found among ancient ruins.

Verde di Pegli.—This is a serpentine found near the torrent of *Varenna*, in Genoa. Some varieties of it are brecciated, having a ground of light green with spots and patches of rich green, produced by fragments of serpentine. See *Serpentine*.

Verde di Prato.—This is a deep green serpentine with dark spots, occasionally consisting of noble serpentine. It is

quarried amongst the Apennines at a few miles from Florence. It is not obtainable in large sizes.

Verde di Suza.—This marble, found at Suza, in Piedmont, resembles Verde Antico, which see.

Verde di Voltri.—This marble, which presents varying shades of darkish green, is quarried near Genoa.

Verona.—The marble called Verona is a breccia containing crimson, pale red, and blue. It is quarried at Vallarsa, in the Trentin, Italy. Two reddish marbles are found at Verona, the general colour being a hyacinth red, inclining to yellow. The finest quality is of a brilliant red and contains fossil spiral shells. The other variety presents a dirty red. Another marble found in the Verona quarries is called Marbre Osseux. See Osseux.

Vert d'Egypte.—The French name for Egyptian Green, which see. The terms Vert d'Egypte and Vert de Mer are sometimes applied to Verde di Genova, which see.

Vert de Gênes.—See Verde di Genova.

Vert Maurins.—This is a serpentine named after its quarry in the Upper Alps. It is dark green with light green interlacing veins. It is much esteemed.

Véru.—In this locality, near St. Céré, in Lot, France, is quarried a serpentine of a clear yellowish green, with numerous small blackish green veins.

Veyrette.—The marble named thus after its quarry in the Upper Pyrenees, France, is greenish white with veins of fiery red. It is also called Vert d'Antin. See Antin.

Victoria Red.—This marble, quarried in Cork, Ireland, is of a brilliant red variegated with light coloured patches and mottling.

Vièrge.—This term, the French equivalent for virgin, is applied generally to pure white marble. A “marbre vièrge” is quarried at Bayonne, in the Lower Pyrenees. It is a white statuary, but is liable to turn yellow rapidly on exposure.

Vieux.—This name is given to marbles quarried in the neighbourhood of Vire, in Calvados, France. Some varieties exhibit a pinkish ground, with fossil madrepore shells. Others are fine-grained granites, both grey and reddish yellow. They are easily worked.

Villebois.—See Ain.

Villefranche.—This marble, named after its quarry in the Eastern Pyrenees, France, is a cervelas or sausage marble, having a red ground with white and green spots.

Violon.—This marble, quarried at Vodelée, in Namur,

Belgium, has a ground of dark grey blended with lighter and slightly pinkish grey, with numerous grey veins following somewhat parallel directions, and traversed by paler and more irregular veins. Another variety, quarried at the same place, is called Grand Courtil. It has a similar ground to the above, but its shades are more intermingled, and it has large white ramified veins.

Vire.—See Vieux.

Vizille.—This marble, named after its quarry in Isère, France, is of a yellowish white, with reddish brown veins. It takes a high polish.

Vulpino.—See Bardilla.

Wetton (Derbyshire).—The marbles quarried at Wetton, in Derbyshire, have mostly a ground of brownish grey, with small grey dots and rings, caused by fossils.

Wetton (Staffordshire).—The marbles quarried at Wetton, in Staffordshire, comprise varieties of dark greenish grey mingled with yellowish grey, and having brown and yellow veins. Some specimens exhibit mixtures of brown and grey, with thin veins of dark reddish brown. Black marble is also quarried at Wetton. See Black.

White.—See Statuary.

Williamston Park.—See Pembrokeshire.

Yellow.—The yellow marbles most in use for decoration comprise varieties of Siena, and those which have the Italian prefix *giallo*, or the French *jaune*, which mean yellow.

Yellow Lumachella.—See Lumachella Castracani.

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